Importance of SOA in a Large Cancer Center IT Environment

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MDACC

6/3/09
MD Anderson Cancer Center Environment

• Largest Cancer Center in US
• Mission:
  – Cancer treatment
  – Research
• IT Mission – integrate clinical and research data to benefit the patient
SOA at MDACC

Rationale

• Integration of Clinical and Research Databases
• Interoperable applications
• Data Standards
  – caBIG common data elements (CDE)
SoA “Anatomy”

- EMR – ClinicStation (proprietary)
  - Clinical Portal example: patient demographic page
  - 3M service calls/day
- CTMS - Velos eResearch®
  - CDE-based bidirectional service in construction
- HRPP – TBD (IRB, scientific review, audit)
  - RFA specifies SOA
- Service for .gov, sponsors, NCI
EMR - Demo
Why MDACC is interested in SOA

• Need for data integration
  – Intra-institutional
    • Translational research
    • Collaborative research
    • Protocol approval
    • Regulatory management (audits)
  – Inter-institutional
    • Multi-institutional trials
    • Ad-hoc collaborations
Why MDACC is interested in SOA

- Data transmission/reporting
  - Cancer Center to NCI/FDA/.gov
    - FDAAA: summary → individual pt.
  - Comprehensive Gov outcomes reporting
    - SCT now
    - Soon to all of us (Health Care Reform)
  - Sponsored trials (BRIDG, HL7 v.3 RIM by 2012)

MDACC has 147 databases containing research data!
Why MDACC is interested in SOA

- “Single source of truth”
  - Source data issue for compliance
  - Copying = data dyssynchrony
  - Point-of-service data acquisition
    - Generally, data quality is highest at POS
  - Institutional data custody

- “Single service source for data standards”
  - Single path for external data reporting
Data Standards

• SOA and data standards/models are completely linked.
  – The more universally recognized, the more powerful data standards become (decreased mapping)

• SOA implies data VIEWS (not copies) displayed by non-primary source apps

• Audit (study) files as database objects are important
SOA / Web Service Examples

• Clinical Research Enterprise
  – Clinical Trials Management System CTMS
  – SPIDR > Velos > EMR

• Clinical Research Departmental
  – Stem Cell Transplantation and Cellular Therapy
  – SPIDR > BMTWeb > AGNIS (NMDP)
SOA and Velos

- MDACC Pilot Phase completed
  - Created and tested Inbound and Outbound Services
  - Tested security layer with services

- Preimplementation goals:
  - Comprehensive Service Layer – maintained by Velos
  - Service Buss – S-Layer communication through a S-Buss
  - Data standards service to libraries
  - Services are views only unless business/work flows dictate storage
  - Services are decoupled not relying on other services
  - Services are self contained
Pilot Services

Service Providers

Service Consumers
Pilot Services

Service Providers

SOA

Service Consumers
Pilot Services

Service Providers

Security

SOA

Service Consumers
Pilot Services

Service Providers

Service Response

Security

SOA

Data Standards

Service Request

Service Consumers
Pilot Services

Service Providers
- SPI DR Results
- SPI DR Lib

Service Response

Security

SOA
- Data Standards

Service Request

Service Consumers
- Velos SPI DR results
- Velos SPI DR Lib
Pilot Services

Service Providers
- SPI DR Results
- SPI DR Lib
- Velos Calendars
- Velos Study Pts
- Velos Studies

Service Consumers
- Velos SPI DR results
- Velos SPI DR Lib
- EMR Calendars
- EMR Study Pts
- EMR Studies

SOA
- Data Standards
- Security

Service Request
Service Response
Pilot Services

Service Providers

Service Response

Security

SOA

Data Standards

Service Request

Service Consumers
SPIDR Pathology Service

**Live Programs/Systems**

- **Spidr Admin Tools**
  Used by LIS staff to maintain SPIDR components. Includes HL7 viewer, interface monitoring tools, and lookup table maintenance fuctions.

- **Spidr Donor Deferral**
  Used to track individuals that are placed on the donor deferral list.

- **Spidr Web Service (Production)**
  Link for MDACC community to access SPIDR data request object and data return schemas, to get patient pathology Case information from Tamron, and perform ad hoc data requests to SPIDR.

- **Concept Code List (Live System)**
  A list of the test members for every SPIDR concept code.

**Test Programs/Systems**

- **Spidr Web Service (Test)**
  Link for MDACC community to access SPIDR test data by providing MRN, date and client code.

- **Spidr Donor Deferral**
  Used to track individuals that are placed on the donor deferral list.

- **Spidr Viewer**
  Used by LIS staff to review clinical laboratory information.
Click here to here to review the relevant data schemas.

The following operations are supported. For a formal definition, please review the Service Description.

- **GetLabDataTestXml**

  Web service function to return test patient (282273) data.

  **Parameter(s)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start date</td>
<td>The start date of the period requested</td>
</tr>
<tr>
<td>End date</td>
<td>The end date of the period requested</td>
</tr>
<tr>
<td>Client Code</td>
<td>An identifier that defines a specific subgroup of patients. Most patients client codes are 00000. If a user needs a different subgroup, contact SPIDR office for that code.</td>
</tr>
<tr>
<td>Live System</td>
<td>If this flag is set to true then you will receive data from the live system. If this flag is set to false then you will receive data from the test system.</td>
</tr>
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</table>

  **Returns**

  A well-formed XML document.

- **GetLabDataSimpleXml**

  Web service function to return for data for a patient.

  **Parameter(s)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client System Name</td>
<td>The unique client system name, e.g. ClinicStation, CRIS, LDR, etc.</td>
</tr>
<tr>
<td>User ID</td>
<td>The unique identifier for the INDIVIDUAL end user on who is submitting this request.</td>
</tr>
<tr>
<td>Requesting Role</td>
<td>Describes the nature of the request, which has implications for data censoring and auditing. Values include “Clinical”, “Research”, “ReviewPreatoryResearch”, “Qt”.</td>
</tr>
<tr>
<td>Protocol Id</td>
<td>An IRB protocol identifier, if appropriate.</td>
</tr>
<tr>
<td>MRN</td>
<td>MRN (Medical Record Number)</td>
</tr>
<tr>
<td>Start date</td>
<td>The start date of the period requested</td>
</tr>
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<xml version="1.0" encoding="utf-8" ?>
  <wsdl:import namespace="http://spidr.org/spidr/ConceptCode.xsd"/>
  <wsdl:types>
    <wsdl:sequence>
      <wsdl:element name="GetLabDataSimple"/>
    </wsdl:sequence>
    <wsdl:sequence>
      <wsdl:element name="GetLabDataSimpleResponse"/>
    </wsdl:sequence>
    <wsdl:sequence>
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    <wsdl:sequence>
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    </wsdl:sequence>
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    <wsdl:sequence>
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    <wsdl:sequence>
      <wsdl:element name="GetConceptCodesXml"/>
    </wsdl:sequence>
  </wsdl:types>
</wsdl:definitions>
## VELOS Lab Events

<table>
<thead>
<tr>
<th>Visit</th>
<th>Suggested Date</th>
<th>Scheduled Date</th>
<th>Visit Window</th>
<th>Events</th>
<th>Event Status</th>
<th>Linked Forms</th>
</tr>
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<tbody>
<tr>
<td>August 2007</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Screening Visit</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>08/01/2007</td>
<td>06/01/2007 £</td>
<td>06/01/2007 -- 08/01/2007</td>
<td>07/30/2007-- 08/01/2007</td>
<td>Baseline Evaluation</td>
<td>Past Scheduled Date C H</td>
<td>NO CRF</td>
</tr>
<tr>
<td>08/01/2007</td>
<td>06/01/2007 £</td>
<td>06/01/2007 -- 08/01/2007</td>
<td>07/30/2007-- 08/01/2007</td>
<td>Alkaline Phosphatase NOS</td>
<td>Past Scheduled Date C H</td>
<td>NO CRF</td>
</tr>
<tr>
<td>08/01/2007</td>
<td>06/01/2007 £</td>
<td>06/01/2007 -- 08/01/2007</td>
<td>07/30/2007-- 08/01/2007</td>
<td>Amylase - Blood</td>
<td>Past Scheduled Date C H</td>
<td>NO CRF</td>
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<tr>
<td>08/01/2007</td>
<td>06/01/2007 £</td>
<td>06/01/2007 -- 08/01/2007</td>
<td>07/30/2007-- 08/01/2007</td>
<td>Bilirubin Total - Blood</td>
<td>Past Scheduled Date C H</td>
<td>NO CRF</td>
</tr>
<tr>
<td>08/01/2007</td>
<td>06/01/2007 £</td>
<td>06/01/2007 -- 08/01/2007</td>
<td>07/30/2007-- 08/01/2007</td>
<td>Blood Bicarbonate</td>
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</tr>
<tr>
<td>08/01/2007</td>
<td>06/01/2007 £</td>
<td>06/01/2007 -- 08/01/2007</td>
<td>07/30/2007-- 08/01/2007</td>
<td>Blood Carbon Dioxide</td>
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<td>NO CRF</td>
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<tr>
<td>Visit 1</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08/16/2007</td>
<td>06/16/2007 £</td>
<td>06/16/2007 -- 08/16/2007</td>
<td>-</td>
<td>Alkaline Phosphatase NOS</td>
<td>Past Scheduled Date C H</td>
<td>NO CRF</td>
</tr>
<tr>
<td>08/16/2007</td>
<td>06/16/2007 £</td>
<td>06/16/2007 -- 08/16/2007</td>
<td>-</td>
<td>Amylase - Blood</td>
<td>Past Scheduled Date C H</td>
<td>NO CRF</td>
</tr>
<tr>
<td>08/16/2007</td>
<td>06/16/2007 £</td>
<td>06/16/2007 -- 08/16/2007</td>
<td>-</td>
<td>Follow Up</td>
<td>Past Scheduled Date C H</td>
<td>NO CRF</td>
</tr>
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</table>
### MRN: M3456
### Date Range: Mon Jul 30 00:00:00 CDT 2007 to Fri Aug 03 00:00:00 CDT 2007
### Concept IDs

<table>
<thead>
<tr>
<th>Concept</th>
<th>Value</th>
<th>Date</th>
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</thead>
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<tr>
<td>Clot Expiration Date</td>
<td>05/15/2008</td>
<td></td>
</tr>
<tr>
<td>ABO Rh</td>
<td>O Pos</td>
<td></td>
</tr>
<tr>
<td>Antibody Screen</td>
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</table>

### Screening Visit: Tue Apr 15 14:29:00 CDT 2008
**ACC#: 00008106000004**

<table>
<thead>
<tr>
<th>Test</th>
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<th>Date</th>
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<tbody>
<tr>
<td>Anti-IgG</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Anti-C3</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>DAT Pathologist Interpretation</td>
<td>See Physician Review</td>
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</table>

### Screening Visit: Fri Apr 18 10:42:00 CDT 2008
**ACC#: 00008109000005**

<table>
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<th>Result</th>
<th>Date</th>
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</thead>
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<tr>
<td>Elution Screen</td>
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</tr>
</tbody>
</table>

### Elution Screen: Tue Apr 22 11:41:00 CDT 2008
**ACC#: 00008113000004**

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<th>00008109000005</th>
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<td>Elution Screen</td>
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<tr>
<td>Test Concept ID</td>
<td>2498</td>
</tr>
<tr>
<td>Subject Name</td>
<td></td>
</tr>
<tr>
<td>Specimen Collection</td>
<td>null</td>
</tr>
<tr>
<td>Last Update</td>
<td></td>
</tr>
<tr>
<td>Ordered By</td>
<td></td>
</tr>
<tr>
<td>Ordered Date</td>
<td>Fri Apr 18 10:42:00 CDT 2008</td>
</tr>
<tr>
<td>Status</td>
<td>F</td>
</tr>
<tr>
<td>Reference Range</td>
<td>Negative</td>
</tr>
<tr>
<td>Abnormal</td>
<td></td>
</tr>
<tr>
<td>Comments</td>
<td>*</td>
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</table>

### Screening Visit: Tue Sep 02 11:31:00 CDT 2008
**ACC#: 00008246000001**

<table>
<thead>
<tr>
<th>ABO Rh</th>
<th>O Pos</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibody Screen</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Clot Expiration Date</td>
<td>09/05/2008</td>
<td></td>
</tr>
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</table>

### Screening Visit: Wed Sep 17 12:37:00 CDT 2008
**ACC#: 00008261000004**

<table>
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<tr>
<th>ABO Rh</th>
<th>O Pos</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibody Screen</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Clot Expiration Date</td>
<td>09/20/2008</td>
<td></td>
</tr>
</tbody>
</table>
SOA / Web Service Examples

• Clinical Research Enterprise
  – Clinical Trials Management System CTMS
  – SPIDR > Velos > EMR

• Clinical Research Departmental
  – Stem Cell Transplantation and Cellular Therapy
  – SPIDR > BMTWeb > AGNIS (NMDP)
Data Integration / Interoperability

• Data In Data Out and Enter Once View Many
• Integrating electronic data to our BMTweb system from Institutional sources.
  – ADT Admission Discharge and Transfer
  – HLA Stored Procedure call and imported into BMTweb
  – Lab WebService SPIdr Shared Pathology Data Repository

• Making our data available with an Integration Engine and Web Services

• AGNIS integration
Integration Engine

• IE Tool that allows us to:
  – Map BMTweb elements to NCI Common Data elements
  – Create XML form sets of CDE’s for data transfer
  – It is WebService based
  – We create shared components with business rules for CDE generation
  – Create error checking prior to transfer
  – Create an audit system allowing us to track all transfers utilized coding and dictionary tools for mapping systems
  – GUI tool for management and transfer
BMTweb Select Screen

Search patient records *** Testing ***

Please select your query parameters here

- MRN
- Diagnosis
- Selection
- Name
- Protocol
- UPN
- CRID
- Recipient#
- Sec. Protocol
- Search
- Search More MRN
- Clear
- Report

Patients found

Found total 259 records that match searching criteria

- Patient MRN
- Patient UPN
- Patient Name
- Diagnosis
- Protocol
- Recipient#
- Acc#
- BMT Doctor
- Registration Date

Add New BMT Patient

- MRN
- Search
- Diagnosis
- Add Patient
- BMT Admin
- PDOL
- Manual
- Log Off

Login user: CMARTINEZ, Login time: 01/14/2008 08:11:17
### BMTweb Diagnosis

**BMTweb Diagnosis**

<table>
<thead>
<tr>
<th>Date</th>
<th>Dx Lymphoma</th>
<th>Stage IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Histology</td>
<td>(116)Composite/discard</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pathology codes[1]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[2] 103 Follicular, mixed, small cleaved &amp; large cell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Findings</td>
<td>10month H/o generalized LNs mostly in the neck, TX antibiotics. Enlarging AX mass monitored no to until 9/98. CTs sh</td>
<td></td>
</tr>
<tr>
<td>Cytogenetics</td>
<td>Tested</td>
<td># cells counted</td>
</tr>
<tr>
<td>Description</td>
<td>unknown</td>
<td></td>
</tr>
<tr>
<td>T. B. Markers noted</td>
<td>B-cell</td>
<td>Rearrangement(s)</td>
</tr>
<tr>
<td>B symptoms</td>
<td>Yes</td>
<td>Zoom</td>
</tr>
<tr>
<td>Largest mass size(cm)</td>
<td>10</td>
<td>Site</td>
</tr>
<tr>
<td>Tumor score</td>
<td>4</td>
<td>Int'l Index Score</td>
</tr>
<tr>
<td>Hemoglobin(g/db)</td>
<td>10.1</td>
<td>LDH(IU/L)</td>
</tr>
<tr>
<td>Smoker</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td># of pack years</td>
<td>unk</td>
<td></td>
</tr>
<tr>
<td>Prior Malignancy</td>
<td></td>
<td>Prior Malignancy Date</td>
</tr>
<tr>
<td>Other, Specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Init Dx record created by DMGJO 02/24/2000 10:00:59

Last modified by DMGJO 08/09/2000 10:00:16
### Serviced Lab Data

#### Patient Serology

<table>
<thead>
<tr>
<th>Type</th>
<th>Date</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABO</td>
<td>03/08/2000</td>
<td>A pos</td>
</tr>
<tr>
<td>ANTIBODY</td>
<td>03/08/2000</td>
<td>NEG</td>
</tr>
<tr>
<td>COOMBS</td>
<td>03/08/2000</td>
<td>NEG</td>
</tr>
<tr>
<td>HEP BsAg</td>
<td>03/09/2000</td>
<td>NR</td>
</tr>
<tr>
<td>HEP BcAb</td>
<td>03/09/2000</td>
<td>NR</td>
</tr>
<tr>
<td>HEP C</td>
<td>03/09/2000</td>
<td>NR</td>
</tr>
<tr>
<td>RPR</td>
<td>03/09/2000</td>
<td>NR</td>
</tr>
<tr>
<td>HIV-1/2</td>
<td>03/09/2000</td>
<td>NR</td>
</tr>
<tr>
<td>HIV P24</td>
<td>03/09/2000</td>
<td>NR</td>
</tr>
<tr>
<td>HTLV III</td>
<td>03/09/2000</td>
<td>NR</td>
</tr>
<tr>
<td>CMV</td>
<td>03/09/2000</td>
<td>NR</td>
</tr>
<tr>
<td>HIV/HCV NAT</td>
<td>03/09/2000</td>
<td>NR</td>
</tr>
<tr>
<td>HIV NAT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WNV NAT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T cruzi Ab</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALT</td>
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<td>22</td>
</tr>
<tr>
<td>BHCG</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Donor Serology

<table>
<thead>
<tr>
<th>Type</th>
<th>Date</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABO</td>
<td>03/07/2000</td>
<td>O pos</td>
</tr>
<tr>
<td>ANTIBODY</td>
<td>03/07/2000</td>
<td>NEG</td>
</tr>
<tr>
<td>COOMBS</td>
<td>03/07/2000</td>
<td>NEG</td>
</tr>
<tr>
<td>HEP BsAg</td>
<td>03/07/2000</td>
<td>NR</td>
</tr>
<tr>
<td>HEP BcAb</td>
<td>03/07/2000</td>
<td>NR</td>
</tr>
<tr>
<td>HEP C</td>
<td>03/07/2000</td>
<td>NR</td>
</tr>
<tr>
<td>RPR</td>
<td>03/07/2000</td>
<td>NR</td>
</tr>
<tr>
<td>HIV-1/2</td>
<td>03/07/2000</td>
<td>NR</td>
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<td>HIV P24</td>
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<tr>
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<tr>
<td>ALT</td>
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<tr>
<td>BHCG</td>
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</table>
### Serviced HLA

**Patient: ******, ******/Donor HLA Tx Seq: 2-Study Entry**

#### HLA Typing

<table>
<thead>
<tr>
<th>Type</th>
<th>Date</th>
<th>Collect D</th>
<th>Res(1)</th>
<th>Locus(1)</th>
<th>Res(2)</th>
<th>Locus(2)</th>
</tr>
</thead>
<tbody>
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#### HLA Typing

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**Prior Pregnancies?**
- Yes
- No

**Prior Transfusions?**
- Yes
- No

**Allergies**
- unk

**Cytotoxic Crossmatch**
- NEG

**Donor HLA Scoring & Med Problems**
- Zoom

*Last modified by DMGJO 03/17/2000 08:00:51 Manually entered HLA data*
## Outcomes

**Response:** Final(Best) CRU

- **Date:** 06/23/2000

**Clinical Relapsed/Progressed**

- **Date:**

**New Histology on progression**

- **Date:**

**Late None-Malignant Events**

**Recurrence Paraneoplastic SD Date**

- **Type:**

**Other Maligns**

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<tr>
<td>01/01/2002</td>
<td>Adenocarcinoma</td>
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</table>

**Patient Died**

- **Date:** 08/12/2002
- **Date Is:** Estimated

**Autopsy**

- **No**

**Last Follow Up Date**

- **08/12/2002**

**Current Status**

- **Death**

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**CS Death Date (not verified)**

- **First BMT at study:** 03/24/2000

- **Response:** D+90
- **Progression:** D+0
- **Other Malignancy:** D+648
- **Last Followup:** D+870

Outcome created by DMGJO 02/24/2000 10:00:59
Last modified by PCFXM 03/19/2003 13:00:41

Login user: CMARTINEZ, Login time: 01/15/2008 11:54:50
IE transfer

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Form Type: RECIPIENT_DEATH

Submission History

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### Business Rule

**Treatment Tab**: copy date --- Tina, Tested ---

**Function Used**: CopySimpleDate

**Question**: Date of Hematopoietic Stem Cell Transplantation (HSCT) for which this form is being completed:
### IE mapping code list

**Business Rule:**
```
Outcome tab: if death_type=c, which is contributing cause of death then can has >one entries ---Tina, Tested ---
```

**Function Used:** SetDeathCause

**Question:** Contributing cause of death

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<tr>
<td>10.0 Hemorrhage</td>
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</tr>
<tr>
<td>11.0 Accidental death</td>
<td>AGNIS: Accidental death</td>
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<tr>
<td>12.0 Other</td>
<td>AGNIS: Other cause, specify</td>
</tr>
<tr>
<td>14.0 Prior Malignancy</td>
<td>AGNIS: Prior malignancy (prior to HSCT)</td>
</tr>
<tr>
<td>2.0 Infection</td>
<td>AGNIS: Infection - organism not identified</td>
</tr>
<tr>
<td>2.1 Bacterial infection</td>
<td>AGNIS: Infection - Bacterial</td>
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<tr>
<td>2.2 Fungal infection</td>
<td>AGNIS: Infection - Fungal</td>
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<tr>
<td>2.3 Viral infection</td>
<td>AGNIS: Infection - Viral</td>
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<td>2.4 Protozoal infection</td>
<td>AGNIS: Infection - Protozoal</td>
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<td>2.5 Other infection</td>
<td>AGNIS: Infection - Other infection, specify</td>
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<tr>
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<tr>
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<td>3.2 Viral, other pneumonia</td>
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<td>3.3 Pneumocystis pneumonia</td>
<td>AGNIS: Infection - Fungal</td>
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<td>3.4 Other pneumonia</td>
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<td>7.0 Recurrence/persistence of disease</td>
<td>AGNIS: Recurrence / persistence / progression of disease reported for first HSCT</td>
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<tr>
<td>8.0 Organ Failure</td>
<td>AGNIS: Organ failure -- other organ failure, specify</td>
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</table>
IE transfer
FN Updated Form

CIBMTR
CENTER FOR INTERNATIONAL BLOOD & MARROW TRANSPLANT RESEARCH

Recipient Death Data

CIBMTR Center Number: 
CIBMTR Recipient ID:  
Today's Date: 2008-01-16

Date of HSCT for which this form is being completed: 1996-07-30

HSCT type: □ autologous  □ allogeneic, unrelated  □ allogeneic, related  □ syngeneic (identical twin)

Product type: □ marrow  □ PBSC  □ cord blood  □ multiple cord blood units infused  □ other product, specify:

To be completed in conjunction with a Form 2100 — 100 Days Post-HSCT Data, Form 2200 — Six Months to Two Years Post-HSCT Data, or Form 2300 — Greater Than Two Years Post-HSCT Data.

1. Date of death: 1996-09-03  □ date estimated

2. Was cause of death confirmed by autopsy?
   1 □ yes  2 □ autopsy pending  3 □ no  4 □ unknown

3. Is an autopsy report attached?
   1 □ yes  2 □ no

4. Cause of death: □
   Codes for cause of death are listed on the following page. If a code for “other, specify” (29, 39, 89, 109, 129, or 900) is entered, specify the cause in the space provided.

Primary: AGVHD  Specify:
Audit Tracking

BMT Patient Data

sex
rac
dx:
protocol:DM97-197
tx_seq:5-Course
course:C1
seq_no:A
death_date:2002-08-12T00:00:00-05:00
autopsy:No
tp_date:2000-03-24T00:00:00-05:00
tp_type:ALLO
cell_type:BM
courseid:2972
flowid:2432
recipient_death.death_cause:2432P7.0 Recurrence/persistence of disease
recipient_death.death_cause:2432C2.0 InfectionOther test

Data Sent to Agnis

form {instanceId=1,publicId=2481311:RECIPIENT_DEATH}
  questionCollection (2513141:Was cause of death confirmed by autopsy?) (1.0)(1)
    value:No
  questionCollection (2484581:Contributing cause of death)(1.0)(1)
    value:Infection - organism not identified
  questionCollection (2484581:Contributing cause of death)(1.0)(2)
    value:Idiopathic pneumonia syndrome (IPS/IPn) IPS, viral, other
  questionCollection (2524121:Date of Death)(1.0)(1)
    value:8/12/2002
  questionCollection (2484822:Is the date of death estimated? E.g. Source of data is a third party and only the month and year were provided.)(1.0)(1)
    value:yes
  questionCollection (2484579:Primary cause of death)(1.0)(1)
    value:Recurrence / persistence / progression of disease reported for first HSCT
  questionCollection (2494660:Was the HSCT type allogeneic, unrelated?) (1.0)(1)
    value:yes
  questionCollection (2494654:Was the HSCT product type marrow?)(1.0)(1)
    value:
  questionCollection (2527909:Hematopoietic Stem Cell Transplant Form Transplantation Today's Date)(1.0)(1)
    value:1/9/2008
  questionCollection (2527911:Date of Hematopoietic Stem Cell Transplantation (HSCT) for which this form is being completed:)(1.0)(1)
    value:3/24/2000
  questionCollection (2527895:CIBMTR Center Number:)(1.0)(1)
    value:  
Audit XML to AGNIS

XML Data Sent to AGNIS

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    <originator uniqueName="cibmtr_center_number:10151" />
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MDA Data Integration Strategy

**MDA Data Standards Repository (DSR)**
- Provides CDEs
- National Data and Vocabulary Standards: caDSR, EVS, SNOMED, CDISC, etc.

**SOA (Service Orientation Architecture)**
- Align and Map
- Service and stores
- Gateway stores and transactional stores
- Federated Research Data Repositories w/ all historical data and real-time and near-time data feed
- Logical model beneath each application conform or map to MDA Enterprise Information Model
- Replication or ETL Data from Transactional Systems to RR / Reporting / Data Warehouse Environments
- Report to external entities FDA (HL7 v3 RIM message), CDUS, NCI, Pharma, etc.

**Vocabulary Service Group**
- Support Analytics across clinical research and translational research
- Dashboard Applications

**SOA Governance**
- Data Modeling

**Data Stores**
- ADT, Lab....
- Reporting Store
- Application Specific Data Stores.
Acknowledgments

• Roy B. Jones PhD MD MDACC
• Lynn H. Vogel PhD, MA, BA MDACC
• Mark J Routbort MD, PhD MDACC
• Mike Warren Riben MD MDACC
• Douglas J. Rizzo, MD, MS CIBMTR
• Martin Maiers PhD NMDP
Thank You!

Questions?