Data Collection and Analysis from Multiple Research Sites

### Jeffrey Krischer, Ph.D.

Data Technology and Coordinating Center Rare Diseases Clinical Research Network\*

International Conference on Rare Diseases & Orphan Drugs February, 2005 Stockholm, Sweden

\*Supported by ORD, NCRR

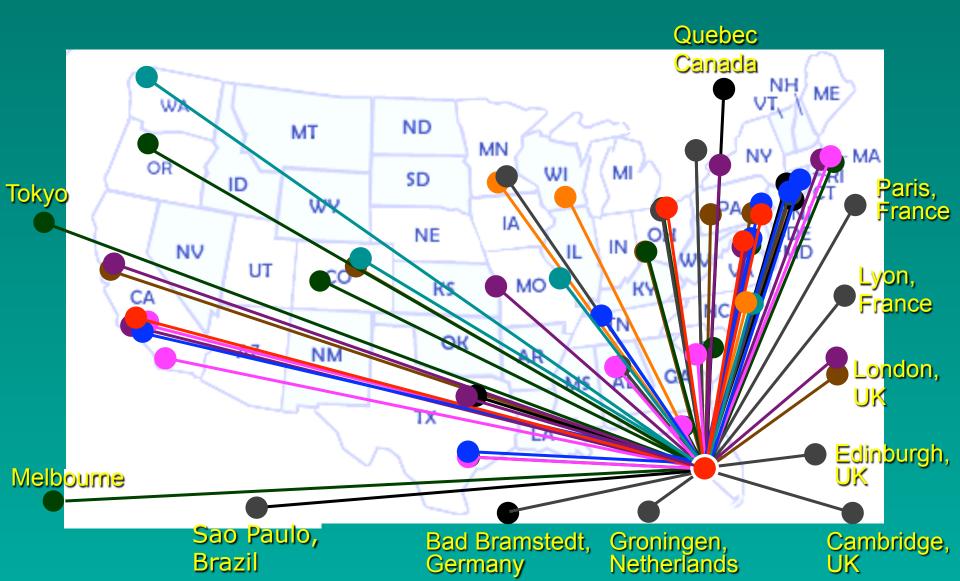
# Rare Diseases Clinical Research Network

### Consortia:

- 1. Channelopathies
- 2. Vasculitis
- 3. Genetic Steroid Disorders
- 4. Bone Marrow Failure
- 5. Urea Cycles Disorders
- 6. Rare Lung Diseases
- 7. Thrombotic Disorders
- 8. Genetic Diseases of Mucociliary Clearance
- 9. Angelman, Rett, PW
  - Syndromes
- 10. Rare Liver Diseases



## **RDCRN Enrollment Sites**



### Forty One Rare Diseases are Currently Under Study in the RDCRN

Alpha-1 Antitrypsin Deficiency Amegakaryocytic Thrombocytopenic Purpura Andersen-Tawil Syndrome Androgen Receptor Defects Angelman's Syndrome Antiphospholipid Antibody Syndromes **Aplastic Anemia** Apparent Mineralocorticoid Excess Arginase Deficiency Argininosuccinate Lyase Deficiency Argininosuccinate Synthetase Deficiency Autoimmune Neutropenia Carbamyl Phosphate Synthetase Deficiency Catastrophic Antiphospholipid Ab Syndrome Churg-Strauss Syndrome Citrin Deficiency **Congenital Adrenal Hyperplasia Cystic Fibrosis** Episodic Ataxias **Giant Cell Arteritis** Heparin-induced Thrombocytopenia

Hereditary Interstitial Lung Disease Large Granular Lymphocyte Leukemia Lymphangioleiomyomatosis Microscopic Polyangiitis **Myelodysplastic Syndromes** N-Acetylglutamate Synthase Deficiency Non-dystrophic Myotonic Disorders **Ornithine Transcarbamylase Deficiency Ornithine Translocase Deficiency Syndrome** Paroxysmal Nocturnal Hemoglobinuria Polyarteritis Nodosa Prader-Willi Syndrome Primary Ciliary Dyskinesia Pseudohypoaldosteronism **Pulmonary Alveolar Proteinosis** Pure Red Cell Aplasia **Rett Syndrome** Takayasu's Arteritis Thrombotic Thrombocytopenic Purpura Wegener's Granulomatosis

### **RDCRN** Goals

 To contribute to the research and treatment of rare diseases by working together to identify biomarkers for disease risk, disease severity and activity, and clinical outcome, while also encouraging development of new approaches to diagnosis, prevention, and treatment.

### DTCC Goals

To provide:

 A scalable, coordinated, clinical data management system for collection, storage, and analysis of data of RDCRCs,

 A portal and tools for integration of developed and publicly available datasets for cross-disease data mining at RDCRCs,

Web based recruitment and referral tools,

 A user friendly resource site for the public, research scientists, and clinicians.

Protocol Development

### Protocol development tools

Data forms development
Data collection systems
Protocol tracking
Automated reporting
Interim monitoring
Data analysis

### **Common Protocol Concepts**

Common template
Model informed consent
Common data standards
Data sharing
External Data Safety and Monitoring Board

### **Standards Committee Objectives:**

- Endorse appropriate data representation standards to assure the portability and interoperability of RDCRN research data within and across RDCRN consortia, and with clinical, genomic, and other biomedical data and knowledge.
- Advocate for the data representation needs of clinical research and rare disease research in current Standards Development Organization (SDO) activities.

Encourage the use of endorsed data standards throughout the RDCRN, and, by providing training and education, facilitate data standardization at the source of data collection where possible.

Protocol Development
 Recruitment

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http://www.rarediseasesnetwork.org/

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ome! You have reached the home page ne Rare Diseases Clinical Research ork (RDCRN). Each Consortium within the ork provides detailed information on 'al rare diseases.

#### at if I am unsure of which sortium to visit?

the list to the right for a disease name. you have located it, click on the link for a description which will lead you to the ct consortium.

#### v will this consortium be useful ne?

an take action! Once you have reached orrect consortium, you will be able to join contact registry for clinical research . You will also find several helpful urces that include participating clinical er information, self help and advocacy o information and other useful links.





#### Clinical Research Consortia :

**G** 

#### Urea Cycle Disorders Consortium

Favorites

N-Acetylglutamate Synthase (NAGS) Deficiency Carbamyl Phosphate Synthetase (CPS) Deficiency Ornithine Transcarbamylase (OTC) Deficiency Argininosuccinate Synthetase Deficiency (Citrullinemia I) Citrin Deficiency (Citrullinemia II) Argininosuccinate Lyase Deficiency (Argininosuccinic Aciduria) Arginase Deficiency (Hyperargininemia) Ornithine Translocase Deficiency (HHH) Syndrome

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#### Angelman, Rett, and Prader-Willi Syndromes Consortium

Angelman's Syndrome Rett Syndrome Prader-Willi Syndrome

#### Consortium for Clinical Investigation of Neurological Channelopathies

Andersen-Tawil Syndrome (Periodic paralysis) Episodic Ataxias Non-dystrophic Myotonic Disorders

#### Bone Marrow Failure Disease Consortium

Aplastic Anemia

Myelodysplastic Syndromes Paroxysmal Nocturnal Hemoglobinuria (PNH) Large Granular Lymphocyte (LGL) Leukemia Single Lineage Cytopenias:

- Pure Red Cell Aplasia
- Amegakaryocytic Thrombocytopenic Purpura
- Autoimmune Neutropenia

#### Cholestatic Liver Disease Consortium

PFIC (Progressive Familial Intrahepatic Cholestasis) Bile Acid Synthesis Defects Alagille Syndrome Alpha One Antitrypsin Deficiency

#### Vasculitis Clinical Research Consortium

Wegener's Granulomatosis (WG) Microscopic Polyangiitis (MPA) Churg-Strauss Syndrome (CSS) Polyarteritis Nodosa (PAN) Takayasu's Arteritis (TAK) Giant Cell (Temporal) Arteritis (GCA)

#### **Rare Genetic Steroid Disorders Consortium**

Congenital Adrenal Hyperplasia Androgen Receptor Defects Apparent Mineralocorticoid Excess (Low Renin Hypertension)

#### **Rare Thrombotic Diseases Consortium**

Antiphospholipid Antibody Syndromes (APS) Heparin-induced Thrombocytopenia (HIT) Paroxysmal Nocturnal Hemoglobinuria (PNH) Catastrophic Antiphospholipid Antibody Syndrome (Thrombotic Storm) Thrombotic Thrombocytopenic Purpura (TTP)

#### **Rare Lung Disease Consortium**

Hereditary Interstitial Lung Disease (hILD) Lymphangioleiomyomatosis (LAM) Pulmonary Alveolar Proteinosis (PAP) Alpha-1 Antitrypsin Deficiency (Alpha-1)

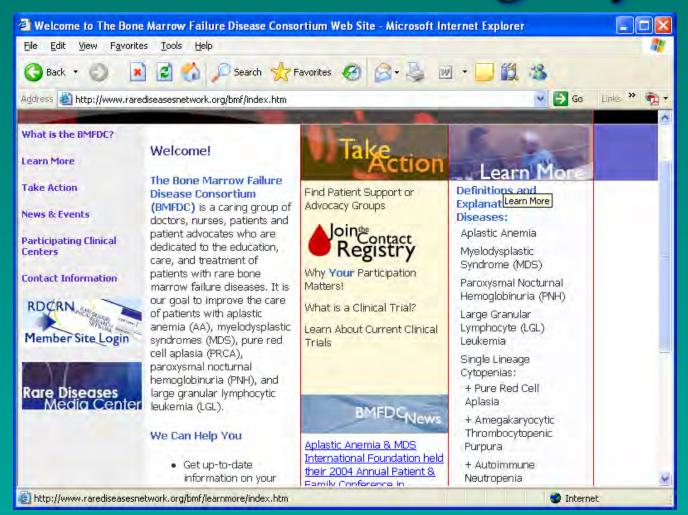
#### Genetic Diseases of Mucociliary Clearance Consortium

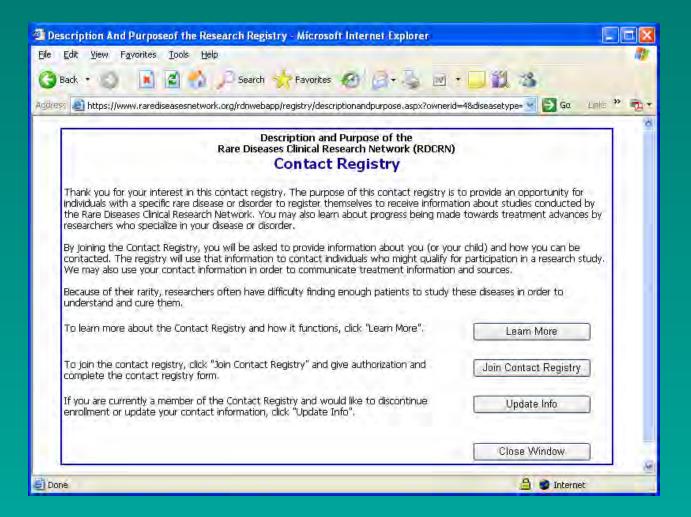
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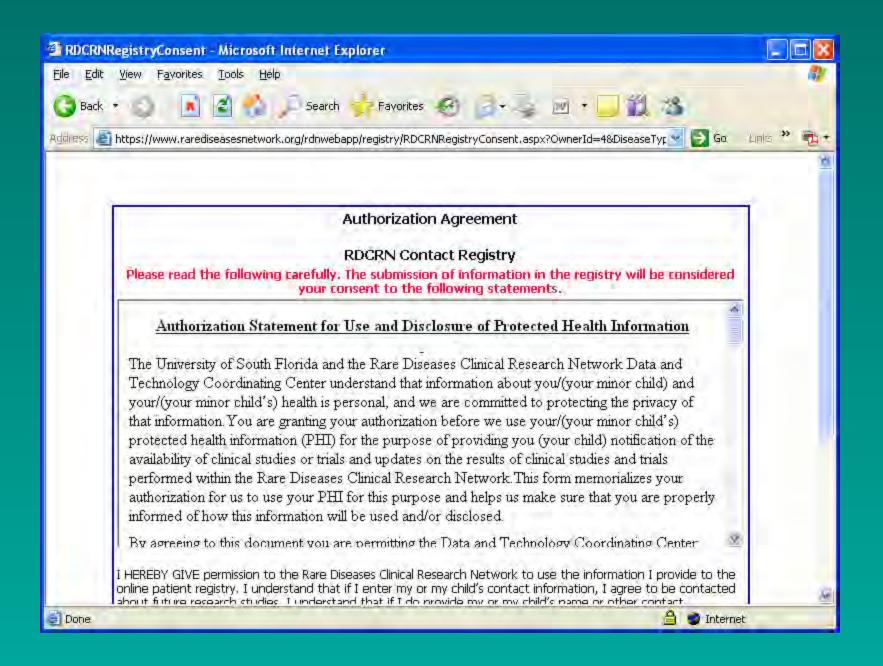
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# Patient Contact Registry







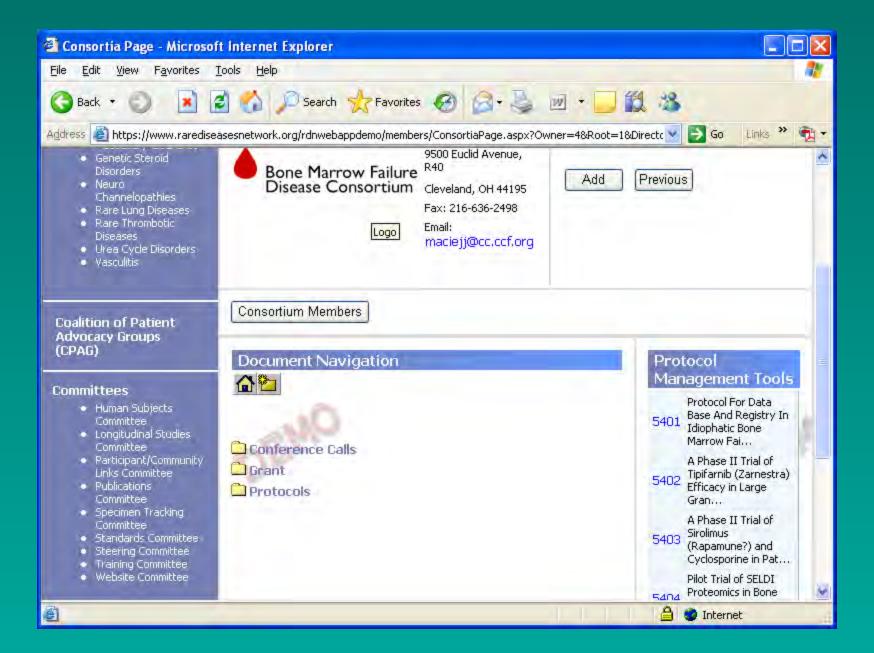
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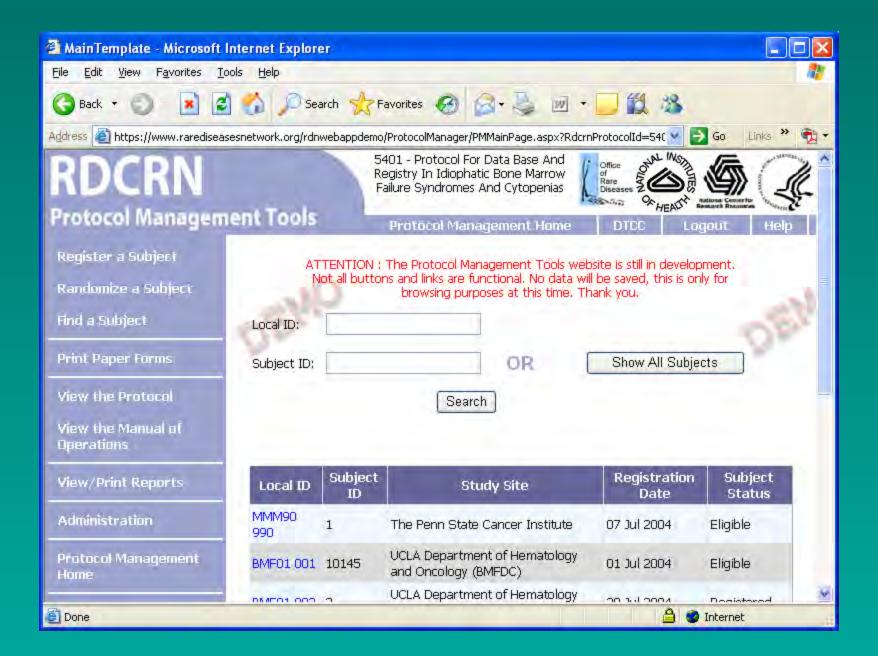
# Patient Contact Registry

- Careful attention to privacy.
- Disseminate information about new studies.
- Identify those who are likely to meet eligibility criteria.
- Provide study related materials.
- Facilitate contact with clinical programs.

Protocol Development
 Recruitment
 Data Collection



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### **Data Collection**

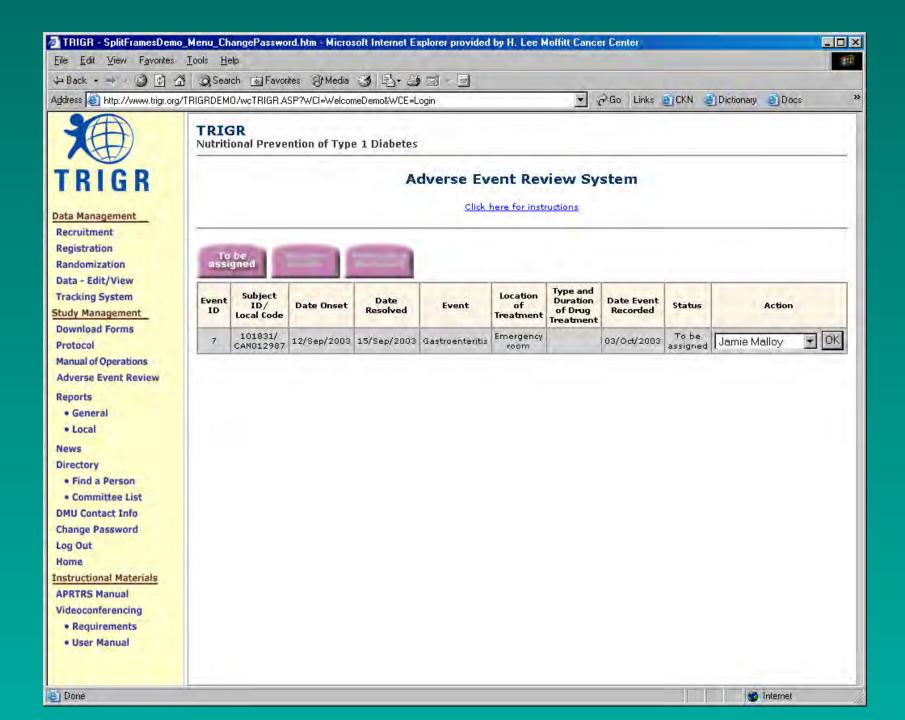
- Web-based protocol management tools :
  - Online data entry
  - Open architecture database systems
  - Electronic information exchange
  - Patient tracking systems
  - Specimen tracking systems
  - Automated reporting

Protocol Development
 Recruitment
 Data Collection
 Adverse Event Reporting

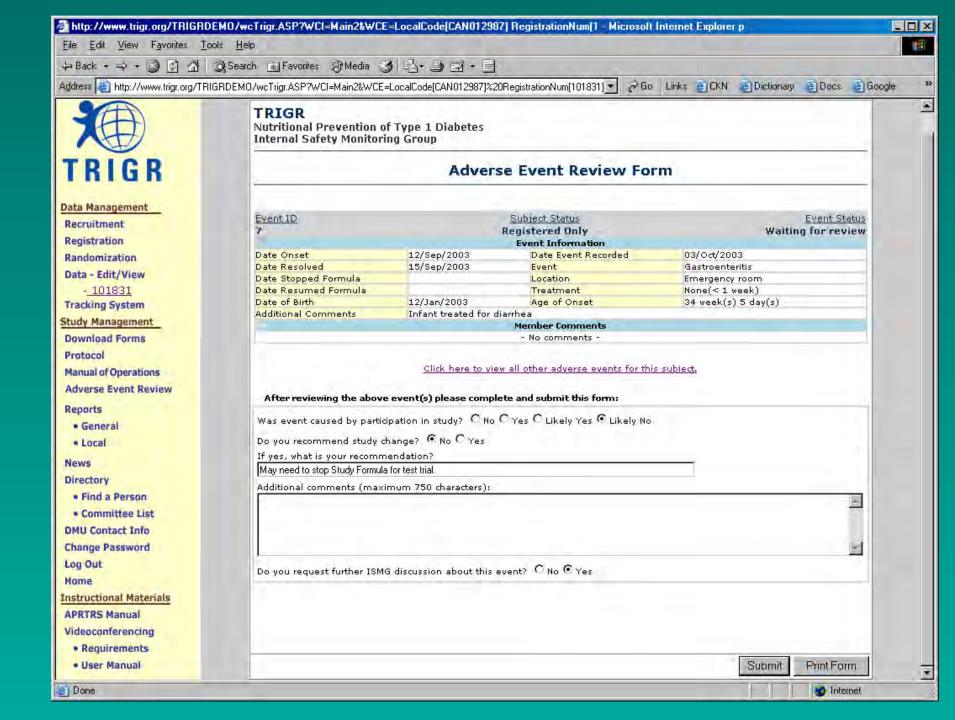
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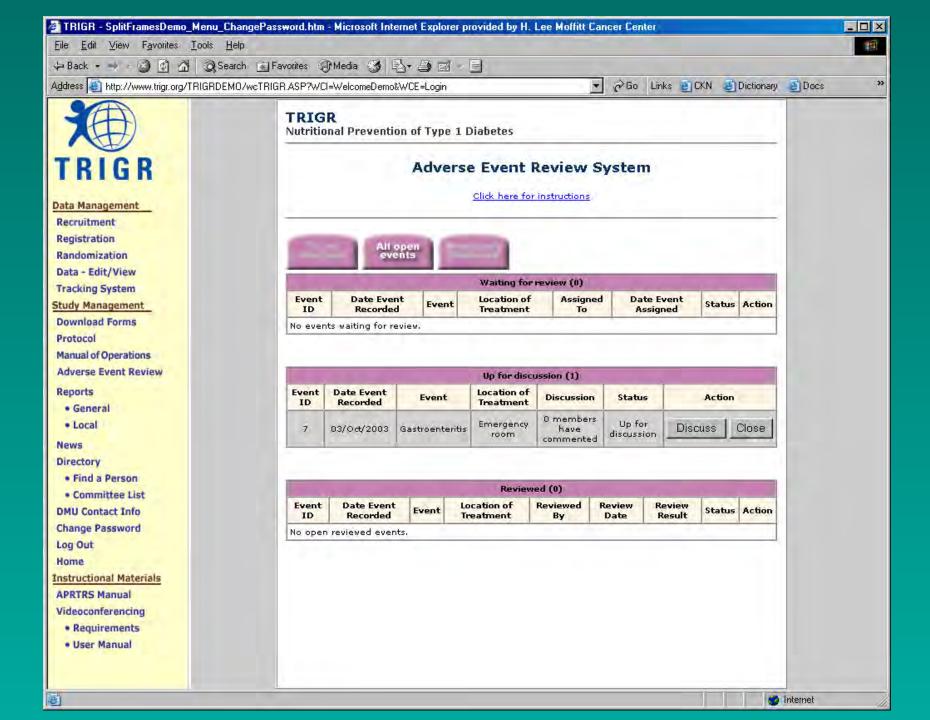
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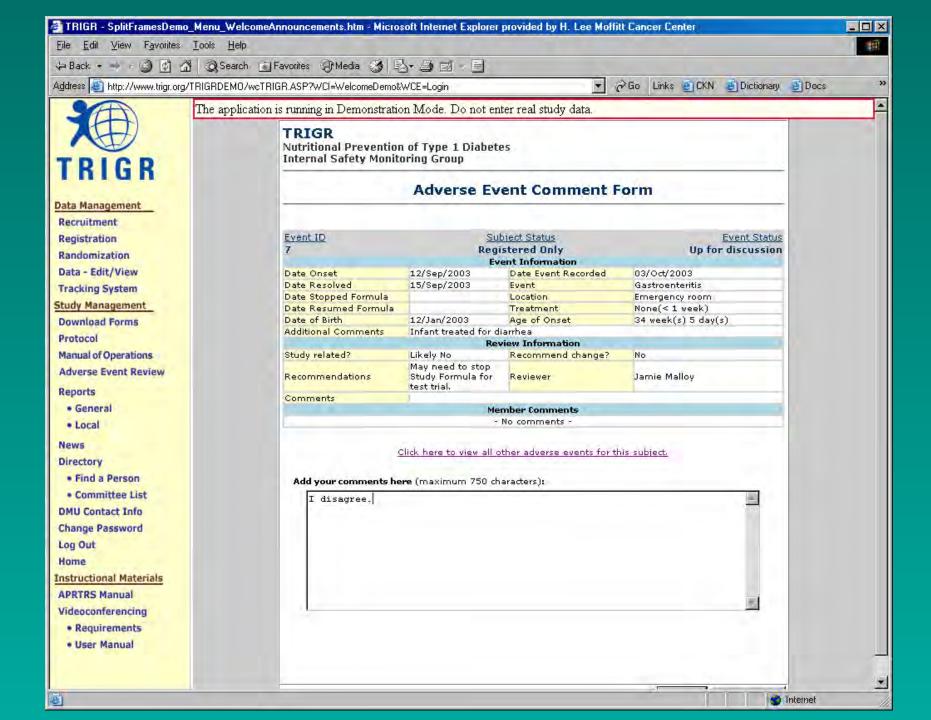


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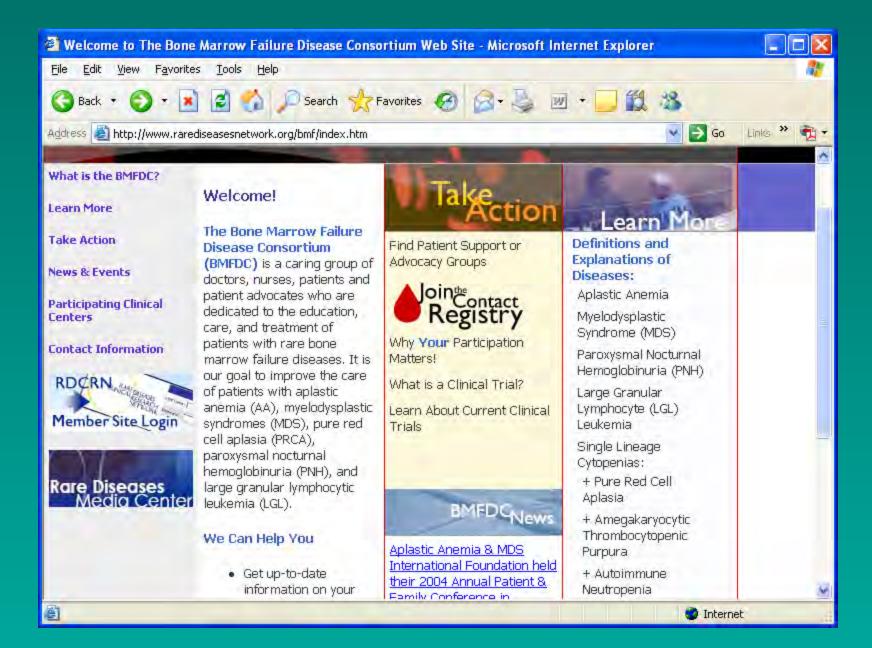


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# **Adverse Event Reporting**

Electronic notification & review.
Central administration.
Role of medical monitor.
Automated reporting.

Protocol Development
Recruitment
Data Collection
Adverse Event Reporting
Dissemination of Research Results





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### Common threads

Multi-center, multi-national, multidisciplinary studies.
Web-based data collection.
Management of large, diverse data bases.

Clinical Trials.

Epidemiology studies.

### **Common threads (continued)**

 Live webcasts Internet-based videoconferencing Video libraries Electronic data exchange with labs and remote sites Interactive voice response systems

for registration/randomization

# Summary

 Collectively, these systems facilitate research in rare diseases by

- transcending geographic boundaries,
- providing a comprehensive informatics environment for the conduct of studies in many different clinical settings and
- promoting standards that enhance the value of the accumulating data for future research.

# Acknowledgement

### NIH:

Stephen Groft Giovanna Spinella Elaine Collier

DTCC: David Cuthbertson Rachel Richesson **RDCRN**: Bruce Trapnell, Chair Steering Comm. Mark Batshaw **Arthur Boudet Robert Griggs Michael Knowles** Jaroslaw Maciejewski **Peter Merkel** Maria New **Thomas Ortell Ronald Sokol**