Proposed Changes to ICD-9-CM Transfusion Associated Adverse Events

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ICD-9-CM Coordination and Maintenance Committee Meeting

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Overview

- The FDA's Center for Biologics Evaluation and Research (CBER) mission is to ensure safety and efficacy of biological products including blood and blood products and thus to protect and enhance public health.

- Under the Food and Drug Administration Amendments Act (FDAAA) of 2007, FDA is responsible for conducting U.S. population-based active surveillance of medical product safety including blood and blood product safety.

- Currently, we are using large medical databases from the Centers for Medicare & Medicaid Services, Health Maintenance Organizations and others to:
  - Conduct active surveillance of adverse events
  - Identify and characterize adverse events associated with the transfusion of blood and blood products

Overview

FDA/CBER submitted a proposal for consideration requesting the addition of new specific ICD-9-CM codes for transfusion-associated adverse reactions:

- Hemolytic Transfusion Reactions (HTRs)
- Transfusion-Transmitted infections (TTI: viral, bacterial, parasitic infections, etc.)
- Febrile Nonhemolytic Transfusion Reaction (FNHTR)
- Posttransfusion Purpura (PTP)
- Transfusion-Associated Circulatory Overload (TACO)
- Hemochromatosis (Iron Overload)

Overview

If introduced, the new transfusion-associated adverse reaction codes will improve:

- Precision with which transfusion-associated adverse events are recorded
- CBER's ability to conduct active surveillance of transfusion-associated adverse events as well as track and identify trends overtime
- CBER's ability to assess transfusion-related adverse reactions

•New Codes will help inform the development of better transfusion-related risk reduction strategies.

Hemolytic Transfusion Reaction (HTR)

- A reaction of increased destruction of red blood cells due to incompatibility between blood donor and recipient.

- Clinical and laboratory signs of HTR: fever, chills, rigors, hemoglobinuria, presence of antibodies to RBC antigens, etc.

- **HTR can be:**
  - Acute or Delayed depending on the **timing** of occurrence
  - Due to either ABO or non-ABO **incompatibility**

Hemolytic Transfusion Reaction (HTR)

- **Acute Hemolytic Transfusion Reaction (AHTR)** –
  Accelerated destruction of red blood cells **less than 24 hours after transfusion**

- **Delayed Hemolytic Transfusion Reaction (DHTR)** – Accelerated destruction of red blood cells which usually manifests 24 hours to 28 days (one month) after a transfusion

- **Common Antibodies Associated with Hemolytic Transfusion Reactions (AHTR, DHTR)**
  Anti-A Anti-B Anti-A,B Anti-C Anti-D Anti-E Anti-c Anti-e Anti-K Anti-k Anti-Jka Anti-Jkb Anti-S Anti-Fya Anti-Fyb Anti-M Other

Hemolytic Transfusion Reactions (HTRs)

- **In FY 2008, HTRs were the leading cause of transfusion-related deaths reported to CBER, representing:**
  - **37% of confirmed transfusion-related fatalities**
  - **22% for ABO mismatch**
  - **15% for non-ABO mismatch**

- **Since 2007, the increase in reported fatalities due to HTRs was due to an increase in fatality reports for both the ABO and non-ABO hemolytic reactions.**

- **The Fatalities Report for FYs 2005 to 2008 can be found on the FDA website:**
  http://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/ReportaProblem/TransfusionDonationFatalities/ucm113649.htm

Hemolytic Transfusion Reactions (HTRs)

Current ICD-9-CM Coding:

- 999.6 ABO incompatibility reaction
- 999.7 Rh incompatibility reaction
- 999.8 Other infusion and transfusion reaction

Hemolytic Transfusion Reactions (HTRs)

Proposed new Coding adds greater specificity to the <u>timing of the reaction</u> and <u>the type of incompatibility</u>:

- 999.6 ABO incompatibility reaction due to transfusion of blood or blood products:

1. 999.62 ABO incompatibility with **acute hemolytic transfusion reaction**
   - ABO incompatibility with hemolytic transfusion reaction **less than 24 hours after transfusion**

2. 999.63 ABO incompatibility with **delayed hemolytic transfusion reaction**
   - ABO incompatibility with hemolytic transfusion reaction **24 hours or more after transfusion**

Hemolytic Transfusion Reactions (HTRs)

Proposed new Coding adds greater specificity to the <u>timing of the reaction</u> and the <u>type of incompatibility</u>:

- 999.7 Rh and other non-ABO incompatibility reaction due to transfusion of blood or blood products:

1. 999.72 Rh incompatibility with **acute hemolytic transfusion reaction**
   - AHTR due to incompatibility **related to Rh antigens (C) (D) (E) (c) (e)**
   - Rh incompatibility with hemolytic transfusion reaction **less than 24 hours after transfusion**

2. 999.73 Rh incompatibility with **delayed hemolytic transfusion reaction**
   - DHTR due to incompatibility related to **Rh antigens (C) (D) (E) (c) (e)**
   - Rh incompatibility with hemolytic transfusion reaction **24 hours or more after transfusion**

Hemolytic Transfusion Reactions (HTRs)

Proposed new coding (Continued):

3. 999.77 Non-ABO incompatibility with **acute hemolytic transfusion reaction**

   - AHTR from incompatibility **related to minor antigens (Duffy) (Kell) (Kidd) (Lewis) (M) (N) (P) (S), etc**
   - Non-ABO incompatibility with hemolytic transfusion reaction **less than 24 hours after transfusion**

4. 999.78 Non-ABO incompatibility **with delayed hemolytic transfusion reaction**

   - DHTR from incompatibility **related to minor antigens (Duffy) (Kell) (Kidd) (Lewis) (M) (N) (P) (S)**
   - Non-ABO incompatibility with hemolytic transfusion reaction **24 hours or more after transfusion**

Transfusion-Transmitted Infections (TTIs)

- **TTIs** include any infectious organism (bacteria, virus, parasite, other) transmitted through transfusion of blood or blood products (whole blood, RBCs, plasma, platelets, etc.)

- **Bacterial transfusion-transmitted infections include:** gram-negative organisms (e.g. Yersinia enterocolitica, Pseudomonas spp , Serratia spp), gram-positive organisms (e.g. Staphylococcus aureus, Staphylococcus epidermidis).

- **Viral transfusion-transmitted infections include:** HIV, Hepatitis, Parvovirus, Cytomegalovirus, Epstein-Barr virus, West Nile virus, etc.

- **Parasitic transfusion-transmitted infections include:** Malaria, Chagas, Babesiosis, etc.

- **Other (e.g. prion) transfusion-transmitted infections include:** Creutzfeldt-Jakob Disease (CJD), vCJD, etc.

Transfusion-Transmitted Infections

- Currently, there is no specific ICD-9-CM diagnosis code for **TTIs.**

- Current Coding includes:
  - 999 Complications of medical care, not elsewhere classified
    - 999.3 Other infection

Transfusion-Transmitted Infections

Proposed Coding to add specificity:

- 999.32 Transfusion-transmitted infection

Use additional code to identify the specified infection, such as:

- **bacterial infection:**
  - bacteremia (790.7)
  - bacterial infection (041.00-041.9)
  - septicemia (038.0-038.9)
    - sepsis (995.91)
    - severe sepsis (995.92)
    - septic shock (785.52)

Transfusion-Transmitted Infections

- **viral infection:**
  - HIV (042)
  - hepatitis virus (070)
  - parvovirus (079.83)
  - West Nile virus (066.4)
  - cytomegalovirus (078.5)
  - Epstein-Barr virus (075)
  - Dengue (061)

- **parasitic infection**
  - Babesiosis (088.82)
  - Chagas disease (086.0-086.2)
  - Malaria (084.0-084.9)
  - Leishmaniasis (085)

- **prion/other infection**
  - Creutzfeldt-Jakob Disease (CJD) (046.19)
  - variant Creutzfeldt-Jakob Disease (vCJD) (046.11)

Febrile Nonhemolytic Transfusion Reaction (FNHTR)

- **FNHTR** clinical signs include:
  fever, chills, rigors without hemolysis and occurs in the patient within 4 hours after transfusion.

- Two most common reaction mechanisms:
  - passively transfused cytokines
  - reaction between recipient antibodies and transfused leukocytes

Febrile Nonhemolytic Transfusion Reaction (FNHTR)

- Currently there is no specific ICD-9-CM diagnosis code for **FNHTR**.
  - 999.8 Other infusion and transfusion reaction
- Proposed Specific Coding:
  - 999.83 Febrile nonhemolytic transfusion reaction (FNHTR)

Posttransfusion Purpura (PTP)

- **PTP** is characterized by sudden severe thrombocytopenia (platelet count <10,000/µL) usually arising 5-12 days following transfusion of blood components (whole blood, RBCs, plasma, or platelets).

- Reaction associated with presence of antibodies directed against the Human Platelet Antigen (HPA) system.

Posttransfusion Purpura (PTP)

- Currently there is no specific ICD-9-CM diagnosis code for **PTP**.

- Current Coding contains:
  - 287 Purpura and other hemorrhagic conditions
    - 287.4 Secondary thrombocytopenia

- Proposed Specific Coding:
  - 287.41 Posttransfusion purpura (PTP)

Transfusion-Associated Circulatory Overload (TACO)

- **TACO** is a circulatory overload following transfusion of blood or blood components
- Characterized by acute respiratory distress, increased blood pressure, pulmonary edema secondary to congestive heart failure, positive fluid balance, etc. during or within 6 hours of transfusion.
- Elderly and infants are at increased risk for TACO occurrence even with small transfusion volumes.
- Occurrence of TACO is very likely to be underreported due to a variety of differential diagnoses that present as Acute Respiratory Distress in the transfused persons including TRALI and anaphylaxis.

Transfusion-Associated Circulatory Overload (TACO)

- Currently there is no specific ICD-9-CM diagnosis code for TACO.

- Current Coding includes:
  - 276 Disorders of fluid, electrolyte, and acid-base balance
    - 276.6 Fluid overload

- Proposed Specific Coding:
  - 276.61 Transfusion-Associated Circulatory Overload (TACO)

Transfusion-Associated Hemochromatosis (Iron Overload)

- **Transfusion-Associated Hemochromatosis** can result from the repeated red blood cell transfusions

- **Hemochromatosis (iron overload)** may result in organ damage, including heart, renal, and liver dysfunction

Transfusion-Associated Hemochromatosis (Iron Overload)

- Currently, no specific ICD-9-CM diagnosis code for **Transfusion-Associated Iron Overload**.

- Current Coding contains:
  - 275 Disorders of mineral metabolism
    - 275.0 Disorders of iron metabolism

- Proposed Specific Coding:

    - 275.01 Hemochromatosis (Iron Overload) due to repeated red blood cell transfusions

    - 275.09 Other disorders of iron metabolism

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