

# 2021

## **RITN Tabletop Exercise (TTX): CDC Post-IND Mortality Form After-Action Report/Improvement Plan**

**Report Date: September 20, 2021**



## EXERCISE OVERVIEW

<b>Exercise Name</b>	2021 RITN Tabletop Exercise (TTX): CDC Post-IND Morbidity Surveillance Form
<b>Exercise Dates</b>	June 22, July 14, July 20, August 10, August 12, August 18, September 14, September 15
<b>Scope</b>	This exercise is a distance-based tabletop exercise over 1 ½ hours, conducted in 8 iterations. Exercise play is limited to RITN facilities and intended to explore the use of the <i>CDC Post-IND Morbidity Surveillance Form</i> .
<b>Mission Area(s)</b>	Response
<b>Capabilities</b>	Public Health & Medical Services
<b>Objective</b>	<b>Objective 1:</b> RITN hospital staff are able to complete and submit the <i>CDC Post-IND Morbidity Surveillance Form</i> and engage in a discussion about the form and its use.
<b>Hazard</b>	Radiological
<b>Scenario</b>	Medical surge from a distant radiological incident
<b>Sponsor</b>	Radiation Injury Treatment Network (RITN) National Marrow Donor Program (NMDP) Centers for Disease Control (CDC)
<b>Participating Organizations</b>	See Appendix B
<b>Point of Contact</b>	RITN Control Cell <a href="mailto:RITN@NMDP.ORG">RITN@NMDP.ORG</a> (612) 884-8276

## EXERCISE SUMMARY

From June through September 2021 (in seven separate iterations of the exercise), RITN centers participated in an online tabletop exercise that consisted of completing the *CDC Post-IND Mortality Surveillance Form* for patients with acute radiation syndrome (ARS) following patient arrival to the hospital from a distant radiological event. A facilitated discussion was conducted after forms were completed and submitted to gather feedback on ease of use, type of data requested, and organization of the form. Due to the subject matter expertise of RITN hospitals, these partners were leveraged to provide input on the draft form. The information captured in this after action report will be provided to CDC to inform future modifications to the form.

### Exercise Background and Assumptions

- Intent of the form is to assist decision makers during the response following an improvised nuclear device (IND).
- Form is intended to be used by all medical facilities, not just RITN hospitals.
- Assumptions:
  - Patient arrives at your hospital 4 days after the IND was detonated.
  - Patient is transported by a family member and not transported via the National Disaster Medical System (NDMS).
- Participant Role Representation:

Role	June 22	July 14	July 20	Aug 10	Aug 12	Aug 18	Sept 14	Sept 15
Bone Marrow Transplant (BMT) Program Clinician	31%	27%	10%	31%	41%	30%	30%	27%
BMT Program Non-Clinical	8%	23%	5%	7%	0%	19%	20%	0%
Emergency Manager	23%	18%	35%	21%	29%	17%	17%	36%
Quality Assurance/Management	15%	18%	20%	24%	24%	23%	20%	18%
Other	15%	14%	30%	17%	6%	11%	13%	18%

## FORM COMPLETION AND PARTICIPANT FEEDBACK

Participants were asked to use a mock patient profile to complete the draft *CDC Post-IND Morbidity Surveillance Form* (<https://ritn.net/display.aspx?id=17179869241>) and submit to the RITN Exercise Control Cell; 209 total forms were submitted from 73 participating hospitals. Several submitted forms was completed by hand and scanned to submit. It took on average of 25 minutes for participating facilities to complete the form. See Appendix A to reference the June 2021 version of the form.

Participants stated that if there were more patients than just the single mock profile used in the exercise, it would take more time and effort to review the electronic medical records (EMR) and populate the forms. However, most agreed that EMR could be used to populate information on the form and those supporting the patient interviews (e.g., emergency management) could be given access to assist with processing a number of patients.

Sending the forms to the RITN Control Cell was a notional process for exercise purposes. The real-world expectation is that forms be sent to the state or county health department and then sent to the CDC. The form is to assist decision makers regarding deployment of scarce resources and, while it should be completed as accurately as possible, is not regulatory.

The sections below outline specific feedback received on the form questions.

### Section 1. Medical Facility Information

Question	Feedback
Questions 1 & 2	<ul style="list-style-type: none"> <li>• Need more space for facility name and interviewer name to be entered.</li> <li>• Specify if it is the physician name or the data manager completing the form; more clarity as to who “interviewer” is intended to be.</li> <li>• Specify if “time” field is military time.</li> </ul>
General	<ul style="list-style-type: none"> <li>• Intake date should be recorded</li> <li>• Self-reported date of the incident or perceived exposure date should be captured.</li> <li>• If handwritten, zeros and the letter “O” may be confused, instructions should include how to document.</li> </ul>

**Section 2. Patient Information**

Question	Feedback
Question 7	Be as specific as possible, such as hospital account/patient number, social security number (though this is often not visible to most health care teams), or JPATS/event number. Unclear of expectations.
Question 11	Consider entry of birthdate rather than age in years/months as this could create error by individuals calculating it
Question 12	Add option for “non-binary” or “prefer not to say” so it does not appear the question was missed.
Question 12 a & b	Add an option for “not-applicable” (N/A) to demonstrate the question was not missed.
Question 13	Race/ethnicity question should have an “other” or “unknown” option.
General	<ul style="list-style-type: none"> <li>• Add a question as to whether the patient is alone or has a caregiver at the time of form completion (minors).</li> <li>• Consider adding phone number contact information for the patient.</li> <li>• Consider a space for an ID number that enables linking a pediatric victim with other family members (children and adults that may have been sent to separate facilities).</li> <li>• Space to document if other family members also have symptoms of ARS.</li> </ul>

**Section 3. Radiation Exposure and Contamination Assessment**

Question	Feedback
Question 14	Recommend more specific direction as to what is meant by geographic location (i.e., address); currently responses could range from “house” to “city/state”. Decrease free text as much as possible.
Questions 15-17	<ul style="list-style-type: none"> <li>• Separate into more options, rather than the combination option of “outside/in a car”, provide additional descriptive selections</li> <li>• Change from “car” to “vehicle” to make it more broad.</li> </ul>
Question 16	Consider a “mixed” option; it seems possible that the person may have sheltered in more than one of the options over a 24 hour period. Or include space for free text entry.
Question 17	Confusing as to whether continuous only or also intermittent exposures are documented. If intermittent is of importance to know, recommend a note to ensure that information is being collected appropriately.
Questions 18-22	Provide a “not reported” category for the self-reported symptoms, it is an evolving situation so this may be more efficient than using “none” and “unknown” categories.

Question 21	Create an option to note if the fever was “reported” or “measured”. Only provides a snapshot in time (no data if it was previously high fever).
Question 23	Combine with Questions 24a & 24b as a single question about burns.
Question 24	<ul style="list-style-type: none"> <li>• Add “Not Applicable (N/A)” option so it is clear the question was addressed rather than missed.</li> <li>• Clarify what is desired for the burn and wound questions.</li> <li>• Or redesign the layout of the form so that 23, 24, and 25 aren't all at the same level -- instead, have 24 &amp; 25 be inset as sub-questions whose responses are more clearly contingent upon response to 23.</li> </ul>
Question 25	<ul style="list-style-type: none"> <li>• Do not think we would have information on internal contamination; contamination is a strong word to use here.</li> <li>• No question to address external contamination or decontamination efforts to date – consider adding.</li> </ul>
Question 26	<ul style="list-style-type: none"> <li>• May not be necessary to include the symptom questions and the questions (26) about dose estimation. Either retain the question on the form about dose estimation, or ask the specific stem questions that allow the estimation to be performed.</li> <li>• Definitions may be help with the dose estimator questions.</li> </ul>
General	<p>Deciding between “no” and “unknown” was challenging; would help to have more clarification as to what is meant.</p> <ul style="list-style-type: none"> <li>• May also be beneficial to include space for narrative for these questions, for example there may be some data to share (e.g., onset of vomiting)</li> <li>• These also occur in Section 4.</li> </ul>

#### Section 4. Medical History and Treatment Information

Question	Feedback
Question 28	<ul style="list-style-type: none"> <li>• May want to indicate follow up for the outpatient option, it is assumed that follow up is required but could add that wording to be clear.</li> <li>• Clarify that this is a snap shot in time (if that is what is meant), as status could change over time.</li> </ul>
Question 30	<ul style="list-style-type: none"> <li>• Assessing percent thermal burn area requires a physician to assess; recommend having a reference with a diagram of the body to show what is meant by the percentage ranges.</li> </ul>
Question 32	Include parameters as to what is considered to be neutropenic (e.g., provider diagnosed, laboratory values).

Questions 32 & 33	Syndromes may not currently be present but it may be helpful to have space to add notes if the clinician feels the patient may begin to experience in future..
Question 33	Clarify if you document “no” or “unknown” if the stool was not tested for blood and is not black/tarry.
Question 35	<ul style="list-style-type: none"> <li>• Evaluate if this can be electronically reported rather than transcribed as this introduces the potential for error.</li> <li>• Laboratory data fields do not capture unit of measure, want to avoid having to make conversions.</li> <li>• Different institutions use different units of measure, consider letting the hospital input the units rather than making conversions.</li> <li>• Need a third decimal place for the “platelets” response.</li> <li>• Consider if ranges (e.g., for platelets) would be easier and more useful, meaningful cutoffs for the range</li> <li>• Do not use SI units for hemoglobin; this is not used in the U.S.</li> <li>• Review the units listed for accuracy (consider definitions for units)</li> <li>• May not need this question since already have the raw laboratory data</li> </ul>
Question 36	In the manual include more about what is meant here ((Acute Radiation Syndrome Diagnosis), for example logic or a chart to have as reference for the conditions and syndromes to know what to look for and document
Question 37	<ul style="list-style-type: none"> <li>• Evaluate if this can be electronically reported rather than transcribed as this introduces the potential for error.</li> <li>• Include “ongoing treatment” as an option or a way to designate if the start/stop date is unknown rather than question skipped.</li> </ul>
Question 38	Do not limit to collecting the complications only relating to G-CSF, collect them in a general sense because they may be caused by other medications, the radiation itself, etc. Change the title to not be specific to G-CSF.
Question 39	<ul style="list-style-type: none"> <li>• Clarify if the form is meant to collect blood products already administered or planned for administration</li> <li>• Consider capturing patient preference for blood products (due to religion etc.)</li> </ul>
Question 40	<ul style="list-style-type: none"> <li>• Clarification needed as to whether response expects only medications given from the day of patient arrival (form completion date) or if the response should include medications started prior that can be found in patient records.</li> <li>• Include a duration or a start/stop date that the medication is intended to be used. E.g., started today and ordered 10 days worth,</li> </ul>

	<p>rather than a “stop date” if the form is being completed in real time.</p> <ul style="list-style-type: none"> <li>• Include “unknown” as an option for the medication start/stop date.</li> <li>• Dose was asked for G-CSF in previous question but not for the other medications, consider adding dose as it might be valuable to compare resource use across sites.</li> <li>• Alphabetize the medication list.</li> </ul>
General	<p>Definitions would be helpful for some of the terminology, especially for non-clinical staff; at a minimum link to a location where definitions can be found.</p>

**Section 5. Patient Outcome**

Question	Feedback
Question 41	<ul style="list-style-type: none"> <li>• More clear instruction (definitions) as to how to document patients, particularly outpatient disposition. With the exercise mock patient, a number of hospitals marked “discharged” while others chose “in progress”, and a few left it blank altogether.</li> <li>• Clarify the timeframe this refers to (e.g., after patient has completed all treatment, at the time treatment is ordered).</li> <li>• Clarify what is meant by month/day/year (e.g., estimated time to completion, time treatment began).</li> <li>• Provide direction (on the form or a link) to assist providers with linking to the appropriate ICD-10 diagnosis.</li> <li>• Suggest check boxes of the most common/likely conditions to select from rather than ICD code.</li> </ul>

**General Feedback on Form Questions**

- Include information on the form about the steps, for example, fill out one form per person and send to “entity” within “X” timeframe, as well as the frequency that it needs to be completed (e.g., immediately, once, weekly, at 30 days). At a minimum include some of the instructions on the form directly and provide a link to where you can find the full information.
- Locations on the form that contain a “/” clarify whether “or” is meant or “and” – in most cases it seems like “or” (e.g., Sections 3 and 4).
- Recommend spelling out “>” or “=” symbols for people not accustomed to math terms.
- Include “Not Applicable (N/A)” on the form where appropriate
- Drop down menus for some of the questions may help non-clinical staff populate technical information from electronic medical records.

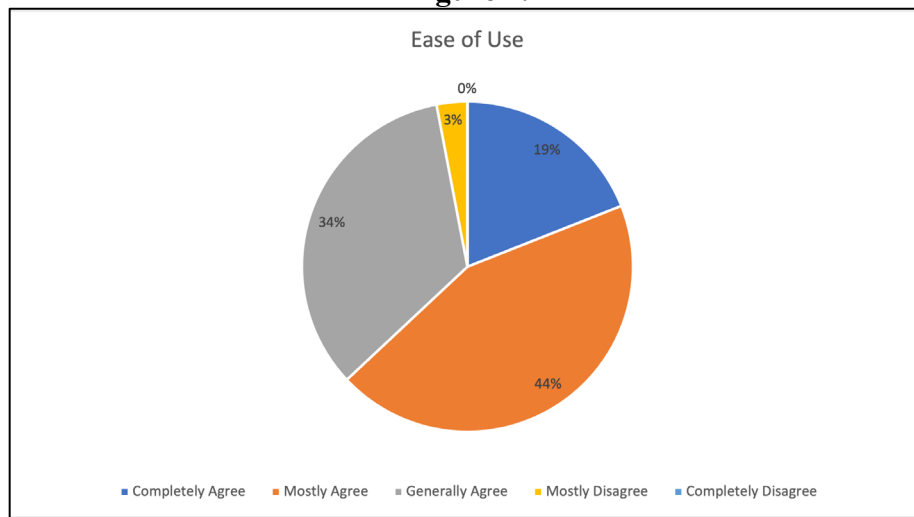


- Add a question about the expectation of survivorship, to give more insight to how decisions are being made locally depending on the type of care the patients are receiving. Ranges such as 90-95% or 10-20% were recommended.
- Dosage (other numbers) did not move easily across the decimal place for entry (fillable form) which could lead to errors and/or slower ability to complete the form.
- The form may fail to capture subtleties in the patient condition (e.g., sub-lethal doses of radiation that are not transplant candidates); it may be productive to have a comments section to provide more flexibility in patient disposition rather than check boxes.
- It was difficult to manipulate some of the data cells on the computer; a tablet is suggested.

### Participant Feedback and Discussion

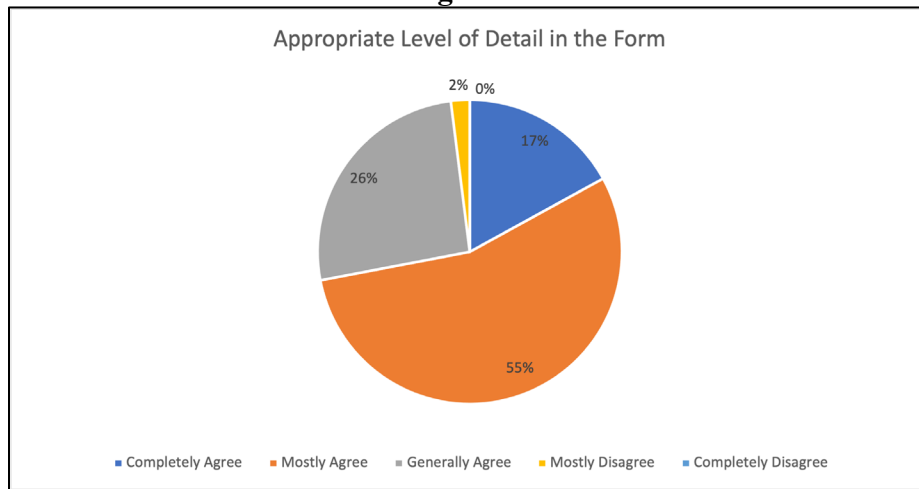
Several poll questions were asked regarding the form. The first was whether the form was easy to understand and complete; of 166 respondents, 97% agreed with the statement (see Figure 1).

**Figure 1.**



The second poll question asked about whether the level of detail requested by the form is appropriate. Of 167 respondents, 98% agreed with this statement (see Figure 2.)

Figure 2.



The final poll question asked if the order and structure of the form made sense; across the seven exercises the response was that 70% of participants agreed with this statement.

On average the form took approximately 20-25 minutes to complete; non-clinical staff likely would require more time to complete the form than those with a clinical background. Additional patients also would impact the turnaround time, depending on how many staff would be available to assist and the required turnaround time for submission.

Based on experience with reporting during the COVID-19 pandemic, multiple facilities made the observation that the form must contain the correct data fields to be used by local, state, and federal levels, rather than requiring different mechanisms to report information to various partners. There was concern about the volume of paperwork without a means to electronically submit. It should strive to be a minimal impact on the health care systems.

The form will be more effective if electronic, but it must be determined how to merge the forms by identification number particularly if tracking the patient's condition over time and across multiple potential locations (i.e., ground zero to the treatment location). If paper will be used to move with the patient over time, a unique identifier is still needed to link the forms. A non-electronic format (or instructions for facilities to make the form available in hard copy) is recommended in the event that power and/or internet is not available.

It will be important to communicate the purpose of the form to hospitals as their willingness to complete it will be increased if they understand the purpose of the data collection.

Questions arose that require further guidance, for example:

- Clarification as to whether patient consent will be required and if there will be an option to opt out of data collection
- Guidance as to whether forms will need to be resubmitted over time for an individual patient, as their status changes. The form and submission process may need to be revised if daily or weekly reporting requirements are in place.
- A template or guidance is needed for the specific points that should be captured in the physician assessment of a patient with radiation exposure, to ensure all data fields for the form are documented (as possible).
- Provide a timeframe or expectation for submission of the initial form (e.g., 24 hours) and subsequent forms if appropriate (i.e., cadence, such as initial arrival of patient, 5 days later, 10 days later, etc.). There were numerous requests for clarification as to whether the form is static (i.e., snapshot in time) or if it is intended to be updated as patient care evolves. Also the context/purpose for data use (e.g., prospective, retrospective).

### Strengths

The following strengths were demonstrated:

**Strength 1:** The form was comprehensive, questions flowed well and were not particularly difficult to complete by clinical staff using a single mock patient profile.

**Strength 2:** In general, the submitted forms were consistently filled out.

**Strength 3:** Several participants hand completed the form and scanned it to the RITN control cell, demonstrating that the form can be utilized offline.

**Strength 4:** Participation in the tabletop exercises was strong with representation from 73 different organizations across seven different exercise dates (209 individual participants).

### Areas for Improvement

The following areas require improvement:

**Area for Improvement 1:** The time-to-complete/submit expectations need to be clear; this should be outlined in the instructions (e.g. one time completion, once every 24 hours, Day 1 and Day 10 as well as email/fax to send it to).

**Area for Improvement 2:** The purpose of the forms should be clearly communicated to hospitals as there was confusion about the level of expertise needed to respond to the questions. That is, it is not regulatory rather assists decision makers with high level trends and resource deployment decisions.

**Area for Improvement 3:** The form is long; there was feedback that perhaps less detail would be sufficient for some of the questions (example: complications of G-CSF may not be relevant or removing the symptoms if a dose estimation is made).

**Area for Improvement 4:** The form may be more user-friendly if electronic, but despite whether in electronic or paper format, if patients are to be tracked temporally or geographically during an incident it is necessary to be able to link unique identification numbers.

**Area for Improvement 5:** The form fields should ensure that they capture information that would be required at the local, state, and federal level to avoid duplicative data collection efforts as was observed during the COVID-19 pandemic.

**Area for Improvement 6:** Many hospitals would not have the bandwidth to complete a large number of forms in a short time period; a realistic expectation for time to submit the data is needed to prioritize against other response duties. HICS would have to designate staff.

**Area for Improvement 7:** There was a disconnect between some of the questions, where some responses seemed to be acute/real time answers while others requested information as if you were seeing the patient for follow up.



25. INTERNAL CONTAMINATION SUSPECTED? <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unk.	
26. WAS A DOSE ESTIMATION CALCULATED FOR THE PATIENT? (if yes, indicate the method used and dose) <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unk.	
26a. DOSE ESTIMATION METHOD USED? <input type="checkbox"/> Chromosome analysis (dicentrics) <input type="checkbox"/> Prodrormal symptoms <input type="checkbox"/> Dose reconstruction <input type="checkbox"/> Time to onset of vomiting <input type="checkbox"/> Lymphocyte depletion kinetics <input type="checkbox"/> _____	26b. DOSE ESTIMATION? <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> Gy

**SECTION 4: MEDICAL HISTORY AND TREATMENT INFORMATION**

27. COMORBIDITIES				
<input type="checkbox"/> Alzheimer's / dementia	<input type="checkbox"/> COPD / pulmonary fibrosis	<input type="checkbox"/> Intellectual disability	<input type="checkbox"/> Seizures	<input type="checkbox"/> Thyroid disease
<input type="checkbox"/> Atrial fibrillation / atrial flutter	<input type="checkbox"/> Coronary artery disease	<input type="checkbox"/> Leukemia / lymphoma	<input type="checkbox"/> Sickle cell disease	<input type="checkbox"/> _____
<input type="checkbox"/> Asthma	<input type="checkbox"/> Diabetes	<input type="checkbox"/> Liver disease	<input type="checkbox"/> Sickle cell trait	<input type="checkbox"/> _____
<input type="checkbox"/> Autoimmune disease	<input type="checkbox"/> Hepatitis	<input type="checkbox"/> Mental health illness	<input type="checkbox"/> Solid tumor / cancer	<input type="checkbox"/> _____
<input type="checkbox"/> BMI > 30	<input type="checkbox"/> HIV / AIDS	<input type="checkbox"/> Organ transplant	<input type="checkbox"/> Stroke	<input type="checkbox"/> None
<input type="checkbox"/> Chronic kidney disease	<input type="checkbox"/> Hypertension	<input type="checkbox"/> Physical disability	<input type="checkbox"/> Thrombotic disease	<input type="checkbox"/> Unk.
28. PATIENT ADMISSION STATUS				
<input type="checkbox"/> Inpatient (If checked, please specify the bed type below)				
BED TYPE				
<input type="checkbox"/> General <input type="checkbox"/> Hematology/Oncology <input type="checkbox"/> Palliative <input type="checkbox"/> Burn <input type="checkbox"/> ICU <input type="checkbox"/> Observation				
<input type="checkbox"/> Outpatient				
<input type="checkbox"/> No follow-up required				
29. TRAUMATIC INJURY (if yes, please specify the region below)				
<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unk.				
TRAUMA REGIONS (check all that apply)				
<input type="checkbox"/> head / neck <input type="checkbox"/> face <input type="checkbox"/> thorax <input type="checkbox"/> abdomen / pelvis <input type="checkbox"/> extremities <input type="checkbox"/> external				
Injury Severity Score (link to ISS calculator: <a href="https://www.mdcalc.com/injury-severity-score-iss">https://www.mdcalc.com/injury-severity-score-iss</a> )				
<input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input type="checkbox"/> Unk.				
30. THERMAL BURNS (if yes, please specify degree and BSA % below)				
<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unk.				
BURN(S) DEGREE (check all that apply)				
<input type="checkbox"/> 1st degree <input type="checkbox"/> 2nd degree <input type="checkbox"/> 3rd degree				
BURN SURFACE AREA %				
<input type="checkbox"/> <5% <input type="checkbox"/> 6-10% <input type="checkbox"/> 11-20% <input type="checkbox"/> 21-30% <input type="checkbox"/> 31-40% <input type="checkbox"/> >41%				
31. INFECTION COMPLICATIONS (check all that apply)				
<input type="checkbox"/> Pneumonia <input type="checkbox"/> Sepsis <input type="checkbox"/> Skin infection <input type="checkbox"/> ENT infection <input type="checkbox"/> Colitis <input type="checkbox"/> UTI				
<input type="checkbox"/> _____ <input type="checkbox"/> None <input type="checkbox"/> Unk.				

32. NEUTROPENIA <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unk.				33. GI BLEED <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unk.					
34. CUTANEOUS RADIATION INJURY (erythema or edema) <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unk.									
35. CBC LABORATORY DATA									
	MONTH	DAY	YEAR	TIME (24hrs)	WBC ( $\times 10^9/L$ )	HGB (mmol/L)	PLATELETS ( $\times 10^9/L$ )	ABS LYMPH ( $\times 10^9/L$ )	
a.									
b.									
c.									
d.									
e.									
f.									
36. ACUTE RADIATION SYNDROME (ARS) DIAGNOSIS (If yes, indicate the sub-syndrome below) <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unk. ARS SUB-SYNDROME <input type="checkbox"/> Hematologic <input type="checkbox"/> Gastrointestinal <input type="checkbox"/> Cutaneous <input type="checkbox"/> Neurovascular <input type="checkbox"/> Unk.									
37. COLONY STIMULATING FACTORS ADMINISTERED									
	No	Yes	Unk.	CYTOKINE	STARTED		STOPPED		DOSE GIVEN (include units)
					MONTH	DAY	MONTH	DAY	
a.				FILGRASTIM					
b.				PEGFILGRASTIM					
c.				SARGRAMOSTIM					
d.				ROMIPLOSTIM					
e.				_____					
38. COMPLICATIONS FROM COLONY STIMULATING FACTORS USE? (check all that apply)									
<input type="checkbox"/> Bone pain <input type="checkbox"/> Splenic rupture <input type="checkbox"/> Acute Respiratory Distress Syndrome <input type="checkbox"/> Leukocytosis ( $>11\text{kmm}^3$ ) <input type="checkbox"/> Infusion/injection site reaction <input type="checkbox"/> Systemic allergic reaction <input type="checkbox"/> Serosal Effusions/Capillary Leak Syndrome <input type="checkbox"/> Sickle cell crisis <input type="checkbox"/> None <input type="checkbox"/> Unk.									
39. BLOOD PRODUCTS (check all that apply)									
<input type="checkbox"/> Platelets <input type="checkbox"/> Plasma <input type="checkbox"/> RBCs <input type="checkbox"/> _____ <input type="checkbox"/> None <input type="checkbox"/> Unk.									

40. MEDICATION USE

MEDICATION CODE	STARTED		STOPPED		CODE MEDICATION
	MONTH	DAY	MONTH	DAY	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	01 Doxycycline
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	02 Ciprofloxacin
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	03 Levofloxacin
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	04 Metronidazole
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	05 Trimethoprin/Sulfamethoxazole
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	06 Clindamycin
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	07 Ceftriaxone
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	08 Vancomycin
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	09 Ampicillin/Sulbactam
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	10 Piperacillin/Tazobactam
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	11 Fluconazole
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	12 Amphotericin
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	13 Caspofungin
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	14 Acyclovir
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	15 Diflucan
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	16 Antiemetics (Ondansetron, Granisetron, Metochlopramide, others)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	17 Analgesics (non-opioid, NSAIDS, Acetaminophen)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	18 Opiods
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	19 Antidiarrheals (Loperamide, Diphenoxylate, others)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	20 _____
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	21 _____
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	22 _____
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	23 _____
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	24 _____

**SECTION 5: PATIENT OUTCOME**

41. DISPOSITION STATUS & ASSOCIATED ICD-10 DIAGNOSIS CODE(S)

	MONTH	DAY	YEAR	ICD-10 Diagnosis code(s):	
<input type="checkbox"/> In progress	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/> Transferred	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/> Discharged	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/> Deceased	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>



## APPENDIX B: EXERCISE PARTICIPANTS

Participating Organization	Name	Date
AHN Cancer Institute – West Penn Hospital	Salman Fazal	August 10
AHN Cancer Institute – West Penn Hospital	Yazan Samhouri	August 10
Avera Health	Valorie Johnson	August 18
Avera Health	Rochelle Rentschier	August 18
Barnes-Jewish Hospital at Washington	Chandra White	July 20
Barnes-Jewish Hospital at Washington	Jason Campbell	July 20
Barnes-Jewish Hospital at Washington	Donna Fugate	July 20
Baylor Scott & White Cancer Center	Robin Morton	August 18
Baylor Scott & White Cancer Center	Harold Polk	August 18
Children’s Hospital of Alabama	Shereene King	July 14
Children’s Hospital of Alabama	Melissa Wallace	July 14
Children’s Hospital of Boston	Mary Devine	August 10
Children’s Hospital of Boston	Robert Rowe	August 10
Children’s Hospital of Boston	Sheela Venkatesh	August 10
Children’s Hospital of Boston	Monica Meija	August 18
Children’s Hospital of Boston	Cassey Paula	August 18
Children’s Hospital of Philadelphia (CHOP)	Brian Barth	June 22
Children’s Hospital of Philadelphia (CHOP)	Patricia Hankins	June 22
Children’s Hospital of Philadelphia (CHOP)	Alix Seif	June 22
Children’s Hospital of Wisconsin	Rachel Dziedzic	July 14
Children’s Hospital of Wisconsin	Jennifer Koscielak	July 14
Children’s Hospital of Wisconsin	Julie Waldhart	July 14
Children’s Mercy Hospital (Kansas City)	Barbara Chignola	August 18
Children’s Mercy Hospital (Kansas City)	Kimberly Miller	August 18
Cincinnati Children’s Hospital Medical Center	Elizabeth Nelson	July 20
Cincinnati Children’s Hospital Medical Center	Denise Bellman	July 20
Cincinnati Children’s Hospital Medical Center	Stella Davies	July 20
City of Hope	Shukaib Arslan	August 10
City of Hope	Estela Esquivel	August 10
City of Hope	Armida Pamintuan	August 10
City of Hope	Suke Patel	August 10
Cleveland Clinic Foundation	Donna Corrigan	August 12
Cleveland Clinic Foundation	Rob Dean	August 12
Cleveland Clinic Foundation	Navneet Majhail	August 12
Cleveland Medical Center – University Hospitals	Aaron Koeth	August 18
Cleveland Medical Center – University Hospitals	Merle Kolk	August 18

Participating Organization	Name	Date
Cleveland Medical Center – University Hospitals	Sohang Patel	August 18
Dana Farber / Partners Cancer Center	Abby Maiello	August 10
Dana Farber / Partners Cancer Center	Maria Murray	August 10
Dana Farber / Partners Cancer Center	Jill Tierney	August 10
Dartmouth-Hitchcock Medical Center	Shelly Davis	August 18
Dartmouth-Hitchcock Medical Center	Cristian Howard	August 18
Dartmouth-Hitchcock Medical Center	Michael Timmerman	August 18
Duke University Medical Center	Jennifer Frith	September 15
Duke University Medical Center	Joel Ross	September 15
Duke University Medical Center	Tonya Delargy	September 15
Emory University	Samuel Shartar	August 10
Emory University	Ziad Kazzi	July 14
Fox Chase Cancer Center	Peter Abdelmessieh	August 10
H. Lee Moffitt Cancer Center	Joseph Pidala	August 10
H. Lee Moffitt Cancer Center	Archana Sharma	August 10
H. Lee Moffitt Cancer Center	Renee Smilee	August 10
Karmanos Cancer Center	Joanna Suh	July 20
Karmanos Cancer Center	Angela Gundel	July 20
Karmanos Cancer Center	Toni Clark	July 20
LDS Hospital	Bradley Bulloch	August 10
LDS Hospital	Linda Maeux	August 10
LDS Hospital	Annette Wendel	August 10
Massachusetts General Hospital	Jennifer Andonian	September 14
Massachusetts General Hospital	Cathryn Defuria	September 14
Massachusetts General Hospital	Robert Krupa	September 14
Massachusetts General Hospital	Tara Medich	September 14
Massachusetts General Hospital	John Murphy	September 14
Massachusetts General Hospital	Jacky Nally	September 14
Massachusetts General Hospital	Susan O'Donnell	September 14
Massachusetts General Hospital	Kathryn Turcotte	September 14
Mayo Hospital	Russ Phillips	July 20
Mayo Hospital	Dawn Walker	July 20
Mayo Hospital	Beth Armstrong	July 20
M.D. Anderson Cancer Center	Kathie Nemeth	August 10
M.D. Anderson Cancer Center	Lori Stover	August 10
M.D. Anderson Cancer Center	Melinda Vickers	August 10
Medical College of Wisconsin	Erin Coster-Mullen	July 14
Medical College of Wisconsin	Katherine Worzalla	July 14

Participating Organization	Name	Date
Medical University of South Carolina	Cindy Kramer	July 14
Medical University of South Carolina	Kristy Martin	July 14
Medical University of South Carolina	Elizabeth Williams	July 14
Medstar Georgetown University Hospital	Lou Bartolo	June 22
Medstar Georgetown University Hospital	Emmanuel Ebong	June 22
Medstar Georgetown University Hospital	Monica Barnett	June 22
Medstar Georgetown University Hospital	Lou Bartolo	June 22
Medstar Georgetown University Hospital	Emmanuel Ebong	June 22
Memorial Sloan Kettering	Karen Collum	August 12
Memorial Sloan Kettering	Van Den Bergh	August 12
Memorial Sloan Kettering	Janelle Stewart	August 12
Memorial Sloan Kettering	Elizabeth Hoover	September 14
Memorial Sloan Kettering	Ann Jakubowski	September 14
Memorial Sloan Kettering	Jake Neufeld	September 14
Mount Sinai Hospital (New York)	Rita Jakubowski	August 12
Mount Sinai Hospital (New York)	Donald Cardone	August 12
Mount Sinai Hospital (New York)	Lynean Graham	August 12
Nebraska Medicine	Nicole Godfrey	July 20
Nebraska Medicine	Dawn Jourdan	July 20
Nebraska Medicine	Kim Schmit-Pokorny	July 20
New York University – Langone Medical Center	Matthew Scott	September 15
New York University – Langone Medical Center	Johanna Miele	September 15
New York University – Langone Medical Center	Andrew Dahl	September 15
Northwestern Memorial Hospital	Emily Dowden	July 20
Northwestern Memorial Hospital	Sara Swetman	July 20
Northwestern Memorial Hospital	Emma Ratajczak	July 20
Northwestern Memorial Hospital	Lauren Beirne	July 20
Northwestern Memorial Hospital	Amy Russer	July 20
Northside Hospital (Atlanta)	Anastasia Cacavias	August 18
Northside Hospital (Atlanta)	Katelin Jackson	August 18
Northside Hospital (Atlanta)	Dana Kisala	August 18
Northside Hospital (Atlanta)	Jacquelyn Thornburg	August 18
Northwell Health (New York)	Eileen Fitzgerald	August 18
Northwell Health (New York)	Rosemary McDonnell	August 18
Northwell Health (New York)	Miyuki Yoshida-Hay	August 18
Oklahoma University Medical Center & Children’s Hospital	Colin Hadley	June 22
Oklahoma University Medical Center & Children’s Hospital	Nancy Kohrt	June 22
Oklahoma University Medical Center & Children’s Hospital	George Selby	June 22

Participating Organization	Name	Date
Oregon Health & Science University	Peggy Appel	June 22
Oregon Health & Science University	Lisa Huggler	June 22
Oregon Health & Science University	Richard Maziarz	June 22
Presbyterian/St. Lukes Medical Center	Bryan Pender	September 14
Presbyterian/St. Lukes Medical Center	Christi Ruppe	September 14
Presbyterian/St. Lukes Medical Center	Pat Wagner	September 14
Primary Children’s Medical Center (Utah)	Cheryl Gerdy	August 18
Primary Children’s Medical Center (Utah)	Rebekah Hoffner	August 18
Primary Children’s Medical Center (Utah)	Robyn Toth	August 18
Prisma Health – Greenville Health System	Kristen Kolleda	August 18
Roger Williams Medical Center	Todd Roberts	September 15
Roger Williams Medical Center	Elise Ferrara	September 15
Roger Williams Medical Center	Stephen DeNinno	September 15
Roswell Park Cancer Institute	George Chen	September 14
Roswell Park Cancer Institute	Melissa Everett	September 14
Roswell Park Cancer Institute	Nicole Gerber	September 14
Roswell Park Cancer Institute	Richard Harvey	September 14
Roswell Park Cancer Institute	Erin Hughes	September 14
Roswell Park Cancer Institute	Lisa Privitere	September 14
Rush University Medical Center	Debra Shiflett	August 12
Rush University Medical Center	Christine Simpson	August 12
Scripps M.D. Anderson Cancer Center	Michelle Meyer	August 18
Seattle Cancer Care Alliance	Meghan Donohue	July 14
Seattle Cancer Care Alliance	Jaclyn Jacques	July 14
Seattle Cancer Care Alliance	Irina Mezheritsky	July 14
Spectrum Health	Doug Devries	August 12
Spectrum Health	Troy Quigg	August 12
St. Francis Hospital and Health Centers	Amanda Kalway	September 14
St. Francis Hospital and Health Centers	Jeffery Morgan	September 14
St. Francis Hospital and Health Centers	Kara Solomon	September 14
Stanford Health Care	Sally Arai	July 14
Stanford Health Care	Laura Jackson	July 14
Stanford Health Care	Beth Wu	July 14
Temple University	Wesley Light	August 10
Texas Children’s Christian Hospital	Bernadette Burttschell	August 18
Texas Children’s Christian Hospital	Elisha Colvin	August 18
Texas Children’s Christian Hospital	John Craddock	August 18
Texas Children’s Christian Hospital	Geoff McKeel	August 18

<b>Participating Organization</b>	<b>Name</b>	<b>Date</b>
Texas Children’s Christian Hospital	Alexandra Mendoza	August 18
Thomas Jefferson University Hospital	Jennifer Keene	August 12
Thomas Jefferson University Hospital	John Wagner	August 12
University of Alabama – Birmingham	John Hooper	August 18
University of Alabama – Birmingham	William Mayfield	August 18
University of Alabama – Birmingham	Melinda Rodgers	August 18
University of California – Davis	Emily Rostel	August 10
University of California – Davis	Kristina Spurgeon	August 10
University of California – San Francisco	Jennifer Check	August 18
University of California – San Francisco	Kevin Dugan	August 18
University of Chicago	Hongtao Liu	July 14
University of Chicago	Shannon Parikh	July 14
University of Chicago	Mylove Mortel	July 14
University of Colorado Health	Beth Weeks	August 12
University of Iowa Hospitals and Clinics	Lisa Cantwell	September 14
University of Iowa Hospitals and Clinics	Sheila Ouverson	September 14
University of Iowa Hospitals and Clinics	Allyson Schultz	September 14
University of Florida – Shands Cancer Center	Carey Hudson	August 12
University of Florida – Shands Cancer Center	Linda Laird	August 12
University of Florida – Shands Cancer Center	Ebbin Spellman	August 12
University of Kansas Medical Center	Andy Marshall	July 14
University of Kansas Medical Center	Erica Hupka	July 14
University of Kansas Medical Center	Shaun DaJarnette	July 14
University of Kentucky Medical Center	Jennifer Christian-Biser	September 14
University of Kentucky Medical Center	Heather Spears	September 14
University of Kentucky Medical Center	Tammy Swartz	September 14
University of Maryland Medical Center	Kathleen Ruehle	August 18
University of Maryland Medical Center	Gisele Stevenson	August 18
University Medical Center (Arizona)	Jeffery Pu	September 14
University Medical Center (Arizona)	Cera Wilson	September 14
University of Miami Medical Center	Margaux Poinard	July 20
University of Miami Medical Center	Elyzabeth Estrada	July 20
University of Miami Medical Center	Claudette Edwards	July 20
University of Minnesota BMT Program	Nathan Mohammed	September 15
University of Minnesota BMT Program	Laura Fangel	September 15
University of Minnesota BMT Program	Ainy Saeed	September 15
University of Mississippi Medical Center	Vince Herrin	August 18
University of Pennsylvania Medical Center	Kathleen Cunningham	September 14

<b>Participating Organization</b>	<b>Name</b>	<b>Date</b>
University of Pennsylvania Medical Center	Joanne Hinke	September 14
University of Pennsylvania Medical Center	David Porter	September 14
University of Pittsburgh Medical Center	Sue Gibson	July 20
University of Pittsburgh Medical Center	Evanne Wahale	July 20
University of Pittsburgh Medical Center	Gloria Gotaskie	July 20
University of Rochester Medical Center	Rosemarie Kolker	July 14
University of Rochester Medical Center	Anne Mckenna	July 14
University of Rochester Medical Center	Sharon Swift	July 14
University of Utah	LeAdelle Maez	September 15
University of Utah	Brian McClune	September 15
University of Utah	Francesca Paglione	September 15
University of Virginia Health System	Judy Kauffman	June 22
University of Virginia Health System	Nat Sellers	June 22
University of Wisconsin Hospital and Clinic	Kristi Lehman	August 10
University of Wisconsin Hospital and Clinic	Julie Thiry	August 10
Wake Forest Health	Rebecca Damron	August 12
Wake Forest Health	Inez Inman	August 12
University of West Virginia Health System	Londia Goff	August 18
University of West Virginia Health System	Janelle Humprey-Rowan	August 18
Westchester Medical Center	Sandra Fabricatore	August 18
Radiation Injury Treatment Network (RITN)	Jen Aldrich	
Radiation Injury Treatment Network (RITN)	Curt Mueller	

## APPENDIX C: ACRONYMS

Acronym	Term
AAR	After Action Report
ARS	Acute Radiation Syndrome
BMT	Bone Marrow Transplant
CDC	Centers for Disease Control
CHOP	Children's Hospital of Philadelphia
EMR	Electronic Medical Records
G-CSF	Granulocyte-Colony Stimulating Factor
ICD-10	International Classification of Diseases 10 <sup>th</sup> Revision
IND	Improvised Nuclear Device
JPATS	Joint Patient Assessment and Tracking System
NDMS	National Disaster Medical System
NMDP	National Marrow Donor Program
REAC/TS	Radiation Emergency Assessment Center/Training Site
RITN	Radiation Injury Treatment Network
TTX	Tabletop Exercise