**Data Abstraction Form :**

Investigation of Mucormycosis Disease among Bone Marrow Transplant Patients

Initials: \_\_\_\_\_\_\_\_

Case #: \_\_\_\_\_\_\_\_

Medical Record #: \_\_\_\_\_\_\_\_\_\_\_\_

Date of Birth: //

Reviewers Initials: \_\_\_\_\_\_\_\_

Review Date: \_\_\_\_\_\_\_\_

***Case of Mucormycosis Infection of Interest***

Bone marrow transplant patients with stays in unit 41 and 42 with any presentation of a mucormycosal infection excluding gastrointestinal

WITH

Histopathological or cytopathological examination showing hyphae from needle aspiration or biopsy specimen with evidence of associated tissue damage (either microscopically or as an infiltrate or lesion by imaging)

OR

Positive culture result for a sample obtained by sterile procedure from normally sterile and clinically or radiologically abnormal site consistent with mucormycosal infection.

***Matched Controls***

Bone marrow transplant patients (Preferred) with stays in unit 41 and 42:

* a date of birth is within five years of the matched mucormycosis case’s birthday
* with matched hematologic malignancy (See section II)

Other major risk factors we will assess for and enough controls present, we can consider matching for diabetes status, diabetic ketoacidosis, blood iron overload condition, chronic high-dose corticosteroids use. If necessary we can also expand the control group to hematopoietic stem cell transplant from unit 41, or from unit 41 and 42.

**Case-Case Abstraction Form**

**Section I: Demographic and Admission Data**

1. Age at diagnosis (years): \_\_\_\_\_\_\_\_\_\_
2. Gender: \_\_\_\_\_\_\_\_\_\_(0= Male, 1= Female)
3. Race (Select all that apply): \_\_\_\_\_\_\_\_\_\_

(0=white/Caucasian, 1=black/African-American, 2=Asian, 3=American Indian/Alaskan, 4=Hawaiian/Pacific Islander, 5=not known)

1. Ethnicity: \_\_\_\_\_\_\_\_\_\_(0=not Hispanic, 1=Hispanic, 2=not known)
2. County: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

City: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Phone #: --
2. Date of admission (mm/dd/yy): //
3. Admit diagnosis: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Section II: Underlying Medical Conditions and Risk Factors (at time of admission or before onsets, check all that apply)**

1. General Medical Conditions: ⁯ None  
    Bone Marrow Transplant  
    Other hematopoietic stem cell transplant  
    Diabetes [not Diabetic Ketoacidosis (DKA)]  
    Last Hemoglobin A1C level \_\_\_\_\_\_\_\_\_\_\_\_

Diabetic Ketoacidosis (DKA) during stay on unit

Hemochromatosis

Thalassemia

Transfusion-induced iron overload in the 14 days before or during say on unit

Iron overload for any other reason and/or iron chelation therapy within 14 days prior to exposure to the unit (Desferrioxamine therapy)

1. Immunocompromised State: ⁯ None

Solid organ transplant (ever)

renal ⁯ liver ⁯ lung  heart  other (specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If transplant recipient, date of most recent transplant (mm/dd/yy): \_\_\_\_/\_\_\_\_/\_\_\_\_

Solid tumor malignancy (specify type): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If history of solid tumor, on or had been on chemotx in the 14 days before culture?

Yes  No  Unknown

History of stem cell transplant

Neutropenia (< 500 neutrophils per mm3) within 14 days prior to onset (or admission?)

Total number of neutropenic days within 14 day period: \_\_\_\_\_\_\_\_\_\_\_or  Unknown

Systemic corticosteroids at avg dose ≥0.3 mg/kg/day prednisone (or equivalent) for > 3 weeks

Chronic Granulomatous Disease

Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (specify)

***Hematologic malignancy***

Leukemia

Acute myeloid leukemia (AML) (e.g. M0-M7)

Chronic myeloid leukemia (CML) (e.g. Chronic phase, Accelerated phase, Blast crisis)

Acute lymphocytic leukemia (ALL) (e.g. L1-L3)

Chronic lymphocytic leukemia (CLL) (e.g. B cell origin, T cell origin, Adult T cell leukemia, Sezary   
 syndrome, Unclassified)

Hodgkin’s disease (e.g. Lymphocyte predominant, Lymphocyte rich, Nodular sclerosis, Hairy cell leukemia,   
 Mixed cellularity, Lymphocyte depleted, Large, granular lymphocyte leukemia)

Non-Hodgkin’s lymphoma (e.g. B cell origin, T cell origin)

Aplastic anemia

Multiple myeloma

Myelodysplastic syndrome (e.g. RA, RARS, RAEB-1, RAEB-2, RCMD, RCMD/RS, 5q syndrome, CMML)

Sickle cell anemia

Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If history of heme malignancy, on or had been on chemotx in the 14 days before culture?

Yes  No  Unknown

Graft**-**versus-host disease:

Acute; if yes, record grade (I-IV) \_\_\_\_\_\_\_\_\_\_

Chronic; if yes, check one:  limited  extensive  unknown

None

Unknown

**Section III: Location**

1. Did this patient have any prior **INPATIENT** hospitalizations within 30 days prior to the current admission?

(Include ALL hospitalizations, including those not at Hospital A)

Yes *(fill out table below, with most recent hospital admissions)*  No Unknown

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Facility Name** | **Admission Dates** (mm/dd/yy)-(mm/dd/yy) | **Ward/Bed**  (complete for each location) | **First date at location** | **Last date at location** |
|  |  |  | //  Unk | //  Unk |
|  |  |  | //  Unk | //    Unk |

1. Where was patient admitted from?

Home

Nursing home/subacute care facility

Other acute care hospital

Rehabilitation

Other (specify): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unknown

1. Room history during current admission:

|  |  |  |
| --- | --- | --- |
| **Ward/Room** | **First date at location** | **Last date at location (or Unk)** |
|  | //  Unk | //  Unk |
|  | //  Unk | //  Unk |
|  | //  Unk | //  Unk |
|  | //  Unk | //  Unk |

**Section IV: Laboratory**

1. Did patient have a positive Mucor culture?  Yes  No  Unknown

|  |  |  |
| --- | --- | --- |
| **Culture Date**  (mm/dd/yy) | **Specimen Site/Type**  **(blood, sputum, pleural fluid, CSF, etc)** | **Organism** |
| // |  |  |
| // |  |  |

1. Did patient have a positive Mucor pathology finding?  Yes  No  Unknown

If yes, please complete table:

|  |  |  |
| --- | --- | --- |
| **Date** (mm/dd/yy) | **Anatomical site** | **Organism/Description of Fungal Elements** |
| // |  |  |
| // |  |  |

1. If patient had a head CT, please list date: //

Cavernous sinus thrombosis

Changes to the orbit

Semiacute right frontal lobe infarct

Diffuse sinusitis

Describe other findings: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. If patient had a head MRI, please list date: //

Cavernous sinus thrombosis

Changes to the orbit

Semiacute right frontal lobe infarct

Diffuse sinusitis

Describe other findings: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Does the patient have a history of positive cultures for Mucor?  Yes  No  Unknown

If yes, date of previous culture : //

**Section V: Medications/Procedures**

1. Has patient received immunosuppressive medications (including chemotherapy) within 30 days of the index culture date?  Yes  No  Unknown

If yes, please list: 1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Did the patient receive systemic antifungal medication in the 30 days prior to the date of index culture that were given for reasons other than treatment of the current infection (i.e. prophylaxis or treatment of another fungal infection)? **DO NOT** include drugs given to treat the current infection.

Yes *(fill out the table below)*  No  Unknown

|  |  |  |  |
| --- | --- | --- | --- |
| **Antifungal drug** | **Given?** | **Total days of therapy in 30-day period** | **Date of last dose prior to first culture (mm/dd/yy)** |
| Amphotericin B  (Polyene Antifungal)  Fungizone,  (Lipid-based Polyene Antifungal)  Amphotec  Abelcet  AmBisome  Amphocil,    ABLC  ABCD | Yes  No  Unknown |  | //  Unk |
| Anidulafungin (Eraxis) (an Echinocandin) | Yes  No  Unknown |  | //  Unk |
| Caspofungin (Cancidas) (an Echinocandin) | Yes  No  Unknown |  | //  Unk |
| Fluconazole (Diflucan) (an Azole) | Yes  No  Unknown |  | //  Unk |
| Flucytosine (5FC) (a Nucleoside Analog Antifungal) | Yes  No  Unknown |  | //  Unk |
| Micafungin (Mycamine) (an Echinocandin) | Yes  No  Unknown |  | //  Unk |
| Posaconazole (Noxafil) (an Azole) | Yes  No  Unknown |  | //  Unk |
| Itraconazole (Sporanox) (an Azole) | Yes  No  Unknown |  | //  Unk |
| Voriconazole (Vfend) (a Triazole) | Yes  No  Unknown |  | //  Unk |

1. Was the patient intubated?  Yes  No  Unknown

*If yes, complete the following questions*:

* 1. Where was the patient intubated? (ER, floor, ICU, field): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. Type of intubation: ⁯  Oral ⁯ Nasal
  3. List dates of intubation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  4. Did index culture date occur prior to or after intubation? ⁯ Prior ⁯  After

1. Did the patient have a tracheostomy?  Yes  No  Unknown
   1. If yes, date of tracheostomy? //
   2. If yes, did index culture date occur prior to or after tracheostomy? ⁯ Prior ⁯  After
2. Did the patient have any inpatient respiratory therapies in the 30 days before the index culture date?

Yes  No  Unknown

* 1. If yes, check below:

⁯  NC O2  NC O2 w/ humidified air ⁯ Nebulized meds (SVN)  MDIs ⁯

⁯  CPAP/BIPAP  Other \_\_\_\_\_\_\_\_\_\_\_\_  None  Unknown

* + 1. If ‘yes’ to SVN or MDI, fill in the table below:

|  |  |
| --- | --- |
| **Drug** | **Mode of Administration (SVN or MDI)** |
|  |  |
|  |  |
|  |  |

1. Did patient have any procedures within 30 days prior to the index culture date?

Yes  No  Unknown

If yes, please check all that apply:

Thoracentesis Date: //

Bronchoscopy Date: //

Date: //

Date: //

Thoracotomy (Chest tube insertion) Date: //

Endoscopy Date: //

Transesophageal echocardiogram Date: //

Surgery (1)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: //

OR #:\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(2)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: //

OR #:\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Percutaneous/interventional radiology procedure: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
(specify) Date: //

Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(specify) Date: //

**Section VI: Symptoms**

1. Was the onset of symptoms more chronic, over the course of several weeks?  Yes  No  Unknown
2. Manifested as an acute sinus infection?  Yes  No  Unknown
3. Nasal congestion?  Yes  No  Unknown
4. Fever?  Yes  No  Unknown
5. Headache?  Yes  No  Unknown
6. Facial pain?  Yes  No  Unknown
7. Tinnitus?  Yes  No  Unknown
8. Reddish and swollen skin over nose and sinuses?  Yes  No  Unknown
9. Periorbital edema and erythema (Reddish and swollen skin around the eye)?  Yes  No  Unknown
10. Ptosis of the eyelid?  Yes  No  Unknown
11. Visual problems?  Yes  No  Unknown
12. Edema and hypertrophy of the nasal turbinates?  Yes  No  Unknown
13. Edema and hypertrophy of the posterior pharynx?  Yes  No  Unknown
14. Altered mental status?  Yes  No  Unknown
15. Blindness of the eye?  Yes  No  Unknown
16. Dilated pupil?  Yes  No  Unknown
17. Nonreactive pupil?  Yes  No  Unknown
18. Cavernous sinus thrombosis?  Yes  No  Unknown
19. Evidence of spread to the brain?  Yes  No  Unknown
20. Spread to the orbits?  Yes  No  Unknown

**Section VII: Treatment**

1. Did the patient undergo debridment?  Yes  No  Unknown
2. Myringotomy with insertion of a tympanostomy?  Yes  No  Unknown
3. Hyperbaric oxygen therapy (HBO)?  Yes  No  Unknown
4. Did the patient undergo surgery for treatment (not diagnosis) of rhinocerebral mucormycosis?
5. Yes  No  Unknown
6. If yes, what was the name of the procedure? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(e.g. Frontal lobectomy, Ethmoidectomy, Maxillary sinus antrostomy, Frontal sinusotomy, Sphenoidectomy)

1. Was the patient treated with an antifungal after the infection was diagnosed?  Yes  No  Unknown

If yes, complete table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Antifungal drug** | **Given?** | **Total days of therapy in 30-day period** | **Date of last dose prior to first culture (mm/dd/yy)** |
| Amphotericin B  (Polyene Antifungal)  Fungizone,  (Lipid-based Polyene Antifungal)  Amphotec  Abelcet  AmBisome  Amphocil,    ABLC  ABCD | Yes  No  Unknown |  | //  Unk |
| Anidulafungin (Eraxis) (an Echinocandin) | Yes  No  Unknown |  | //  Unk |
| Caspofungin (Cancidas) (an Echinocandin) | Yes  No  Unknown |  | //  Unk |
| Fluconazole (Diflucan) (an Azole) | Yes  No  Unknown |  | //  Unk |
| Flucytosine (5FC) (a Nucleoside Analog Antifungal) | Yes  No  Unknown |  | //  Unk |
| Micafungin (Mycamine) (an Echinocandin) | Yes  No  Unknown |  | //  Unk |
| Posaconazole (Noxafil) (an Azole) | Yes  No  Unknown |  | //  Unk |
| Itraconazole (Sporanox) (an Azole) | Yes  No  Unknown |  | //  Unk |
| Voriconazole (Vfend) (a Triazole) | Yes  No  Unknown |  | //  Unk |

1. Renal indices monitored during therapy?  Yes  No  Unknown
2. Nephrotoxicity levels during treatment\_\_\_\_\_\_
3. Iron chelator therapy?  Yes  No  Unknown
4. Deferasirox?  Yes  No  Unknown
5. Deferiprone?  Yes  No  Unknown

**Section VII: Outcomes**

1. Was infected sinus tissue or sinus tissue destruction visibly observed?  Yes  No  Unknown
2. Significant devitalized mucous membranes?  Yes  No  Unknown
3. Significant devitalized mucous membranes?  Yes  No  Unknown
4. Necrotic lesions in the:
   1. Nasal mucosa? Yes No  Unknown
   2. Turbinates?  Yes  No  Unknown
   3. Hard palate?  Yes  No  Unknown
5. Extension of the disease into the:

Maxillary sinus?  Yes  No  Unknown

1. Invasion of the surrounding vasculature?  Yes  No  Unknown
2. Spread into the cribriform plate or the orbital apex?  Yes  No  Unknown
3. Did the patient require enucleation?  Yes  No  Unknown
4. Occlusion of the carotid artery, causing an internal carotid artery pseudoaneurysm?   
     Yes  No  Unknown
5. Infarction and necrosis of tissues in other structures?  Yes  No  Unknown  
   Other structures involved?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Was patient diagnosed with rhinocerebral mucormycosis in the medical record?  
    Yes  No  Unknown  Not applicable
7. Date of discharge (mm/dd/yy): //
8. Status at discharge:

Alive  Deceased  Unknown

1. If deceased, date of death: //
2. If patient is deceased, is death certificate available?

Yes  No  Unknown  Not applicable

1. If yes, is invasive fungal infection (IFI) listed as cause of death?

Yes  No  Unknown  Not applicable

If yes, is IFI listed as primary or secondary cause of death? Primary Secondary

1. If patient is deceased, was an autopsy performed?

Yes  No  Unknown  Not applicable

1. If yes, was evidence of invasive fungal infection (IFI) present?

Yes  No  Unknown  Not applicable