Diagnostic Error Measures Worksheet

Diagnostic error is a diagnosis that is missed, incorrect, or delayed, as detected by a subsequent definitive test or finding.[1] Not all misdiagnosis results in harm, and harm may be due to either disease or intervention. Misdiagnosis-related harm is preventable harm that results from the delay or failure to treat a condition actually present (when the working diagnosis was wrong or unknown) or from treatment provided for a condition not actually present. Misdiagnoses represent a substantial unmeasured source of preventable mortality, morbidity, and costs.[2] In order to detect diagnostic error, both process and outcome measures can be monitored. Not every case identified through these measures will be true diagnostic error, nor will every case result in patient harm. However, capturing instances which may be attributable to diagnostic error is an important first step in the improvement process.

The measures are categorized as follows:

- **Outcome measures.** These measures are designed to assess how well the organization is performing core processes associated with preventing diagnostic error.

- **Process measures.** These measures can be used to identify adverse events and measure the overall level of patient harm associated with diagnostic error.

This sample worksheet provides both outcome and process measures associated with diagnostic error and may be used for documenting facility-specific measures as well. Consider using a mix of both process and outcome measures. Review and select the measures that best suit the organization. This worksheet may be adapted and measures may be added as needed per facility policy, procedure, and operational methods. These measures can be used to track performance over time. To do so, it is important to consistently use the same methods in defining, detecting and documenting these measures. Consider the following:

- **Data source.** Determine the data source for the measures that the organization will use. For example, when measuring "number of times an autopsy reveals a different definitive diagnosis," use the autopsy diagnosis versus the patient's primary diagnosis on admission. Whichever value the organization initially chooses, that same value is used for comparison over time.

- **Data collection period.** Select a manageable time period for gathering the data and measures. Enter that period into the corresponding location on the worksheet. The time period should provide enough opportunity to gather sufficient data, and yet be manageable for the person gathering data. The time period for the "number of times an autopsy reveals a different definitive diagnosis" may have exceed the time period required to collect sufficient data for "number of radiology overreads."

Enter the numerator value (e.g., number of times an autopsy reveals a different definitive diagnosis) next to the corresponding measures column on page 2. When the numerator and denominator values are entered, the percentage automatically calculates.

After these measures are obtained, they can be used to trend, benchmark, and track core processes and outcomes associated with diagnostic errors. In addition, after collecting enough data to see a trend, consider setting goals for these measures and using these measures to evaluate the effectiveness of system changes and interventions. Finally, after potential diagnostic error data has been collected, consider categorizing the cases in the "DEER Taxonomy Chart Audit Tool" (available at http://www.patientsafetyauthority.org/EducationalTools/PatientSafetyTools/Pages/home.aspx) to further categorize potential cognitive and system failures.

Notes

1. Graber ML, Franklin N, Gordon R. Diagnostic error in internal medicine. *Arch Intern Med* 2005 Jul 11;165(13):1493-9.
2. Newman-Toker DE, Provonost PJ. Diagnostic errors—the next frontier for patient safety. *JAMA* 2009 Mar 11;301(10):1060-2.

For more information, visit http://www.patientsafetyauthority.org.
This worksheet accompanies
Diagnostic error in acute care. Pa Patient Saf Advis [online]. 2010 Sep [cited 2010 Sep 1].
Available from Internet: http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2010/Sep7(3)/Pages/76.aspx.

Denominators	TIME PERIOD A:	TIME PERIOD B:	TIME PERIOD C:
1. Total number of autopsies performed (for Outcome Measure a):			
2. Total number of postmortem magnetic resonance imaging (MRI) scans performed (for Outcome Measure b):			
3. Total number patient discharges (for Outcome Measure c):			
4. Total number of referrals/consults ordered within a specific patient population (for Cognitive a; Communication and Handoff a):			
5. Total number of patient returns to the emergency department (ED) within 48 hours (for Cognitive b):			
6. Total number of pathology specimens processed (for Testing a):			
7. Total number of laboratory tests ordered (for Testing b):			
8. Total number radiology tests ordered (for Testing c):			

Measures

Measures	TIME PERIOD A:			TIME PERIOD B:			TIME PERIOD C:		
Outcome Measures	INCIDENCE	TOTAL PATIENTS	PERCENTAGE	INCIDENCE	TOTAL PATIENTS	PERCENTAGE	INCIDENCE	TOTAL PATIENTS	PERCENTAGE
a. Number of times an autopsy reveals a different definitive diagnosis / total number autopsies performed									
b. Number of times a postmortem MRI reveals a different definitive diagnosis / total number postmortem MRIs performed									
c. Number of patients with different admitting and discharge diagnoses / total number of patient discharges									

Process Measures									
Cognitive Processing	NUMBER OF TIMES	TOTAL NUMBER	PERCENTAGE	NUMBER OF TIMES	TOTAL NUMBER	PERCENTAGE	NUMBER OF TIMES	TOTAL NUMBER	PERCENTAGE
a. Number of referrals with different or added diagnoses / total number of referrals in a specific patient population									
b. Number of patients returned to the ED within 48 hours who are assigned a new or different diagnosis / total number of patient returns to the ED within 48 hours									
Testing	NUMBER OF TIMES	TOTAL NUMBER	PERCENTAGE	NUMBER OF TIMES	TOTAL NUMBER	PERCENTAGE	NUMBER OF TIMES	TOTAL NUMBER	PERCENTAGE
a. Number of pathology overreads / total number pathology specimens processed									
b. Number of laboratory tests credited / total number of laboratory tests ordered									
c. Number of radiology overreads / total number of radiology tests ordered									
Communication and Handoffs	NUMBER OF TIMES	TOTAL NUMBER	PERCENTAGE	NUMBER OF TIMES	TOTAL NUMBER	PERCENTAGE	NUMBER OF TIMES	TOTAL NUMBER	PERCENTAGE
a. Number of delays (specify timely consult) in obtaining consultations or referrals / total number of referrals/consults ordered within a specific patient population									