



Scoring Methodology

SPRING 2020

CONTENTS

What is the Hospital Safety Grade? 4

 Eligible Hospitals..... 5

 Measures 5

Measure Descriptions..... 9

 Process/Structural Measures..... 9

 Computerized Physician Order Entry (CPOE)..... 9

 Bar Code Medication Administration (BCMA) 10

 ICU Physician Staffing (IPS) 11

 NQF Safe Practices..... 11

 Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) COMPOSITES..... 12

 Outcome Measures 12

 Healthcare-Associated Infections 12

 Hospital-Acquired Conditions..... 13

 AHRQ Patient Safety Indicators (PSIs) 13

Using Secondary Data Sources 14

 Computerized Physician Order Entry (CPOE)..... 14

 Bar Code Medication Administration (BCMA) 14



ICU Physician Staffing (IPS)	15
Healthcare-Associated Infections	16
Weighting Individual Measures	17
Evidence.....	17
Opportunity	17
Impact.....	17
Spring 2020 Standard Measure Weights	19
Scoring Methodology	20
Calculating Z-Scores.....	20
A Note About Negative Z-Scores	22
A Note About Extreme Values	22
Dealing With Missing Data	23
Calculating Weighted Measure Scores	23
Additional Scoring Information	24
Terms Used in Scoring and Public Reporting.....	24
Shared CMS Certification Numbers	24
Updates to Data Used in the Leapfrog Hospital Safety Grade.....	25
Data From the Leapfrog Hospital Survey.....	25

LEAPFROG
HOSPITAL
SAFETY GR^ADE

How Hospitals Can Review Leapfrog Hospital Survey Results Prior to the Data Snapshot Date.....	26
Data From the AHA Annual Survey or AHA Annual Survey IT Supplement	26
How Hospitals Can Review AHA Annual Survey and IT Supplement Submissions Prior to the Data Snapshot Date	27
Data From the Centers for Medicare & Medicaid Services (CMS).....	27
How Hospitals Can Review CMS Data Prior to the Data Snapshot Date	27
How to Participate in the Leapfrog Hospital Survey.....	28
Leapfrog Help Desk.....	28



WHAT IS THE HOSPITAL SAFETY GRADE?

Leapfrog Hospital Safety Grades are assigned to over 2,600 general acute-care hospitals across the nation twice annually. The Safety Grade is becoming the gold standard measure of patient safety, cited in [MSNBC](#), [The New York Times](#), and [AARP The Magazine](#).

The Safety Grade uses up to 28 national patient safety measures from the Centers for Medicare & Medicaid Services (CMS) and the Leapfrog Hospital Survey, and information from other supplemental data sources, to produce a single letter grade representing a hospital's overall performance in keeping patients safe from preventable harm and medical errors. The Safety Grade methodology has been peer reviewed and published in the [Journal of Patient Safety](#).¹

With the Safety Grade, The Leapfrog Group aims to educate and encourage consumers to consider safety when selecting a hospital for themselves or their families. In addition, we believe the Safety Grade will foster strong market incentives for hospitals to make safety a priority. Safety Grades are publicly reported at www.HospitalSafetyGrade.org.

¹ The Leapfrog Hospital Safety Grade uses the below-described data and reflects expert opinion as to the relative importance of each category.

ELIGIBLE HOSPITALS

The Leapfrog Group calculates a Safety Grade for over 2,600 general acute care hospitals. Due to the limited availability of public data, Leapfrog is not able to calculate a Safety Grade for every hospital in the U.S.

Due to the limited availability of public data, The Leapfrog Group is not able to calculate a Safety Grade for the following types of hospitals:

- Critical access hospitals (CAH)
- Long-term care and rehabilitation facilities
- Mental health facilities
- Federal hospitals (e.g., Veterans Affairs, Indian Health Services, etc.)
- Some specialty hospitals, such as surgery centers and cancer hospitals
- Free-standing pediatric hospitals
- Hospitals in U.S. territories
- Hospitals that are missing scores for **more than seven (7)** process/structural measures or **more than five (5)** outcome measures

MEASURES

The Safety Grade utilizes up to 28 national performance measures of patient safety that are collected and publicly reported by the Centers for Medicare & Medicaid Services (CMS) and The Leapfrog Group, and information from other supplemental data sources such as the American Hospital Association (AHA).

The measure set is divided into two domains: (1) Process/Structural Measures and (2) Outcome Measures. Each domain represents 50% of the Safety Grade. The following table lists the 28 measures included in the Safety Grade, as well as the data source and reporting period for each measure. In some cases where a hospital's information is not available for a certain measure, Leapfrog uses a [secondary data source](#) (as indicated in the table). In cases where a hospital's information is not available from any data source, Leapfrog has outlined a methodology for dealing with the [missing data](#).

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SAFETY GRADE

Measure Name	Primary Data Source	Reporting Period	Secondary Data Source	Reporting Period
Computerized Physician Order Entry (CPOE)	2019 Leapfrog Hospital Survey	2019	2018 AHA Annual Survey Information Technology Supplement ²	2019
Bar Code Medication Administration (BCMA)	2019 Leapfrog Hospital Survey	2019	2018 AHA Annual Survey Information Technology Supplement ²	2019
ICU Physician Staffing (IPS)	2019 Leapfrog Hospital Survey	2019	2018 AHA Annual Survey Database ³	2018
Safe Practice 1: Leadership Structures and Systems	2019 Leapfrog Hospital Survey	2019	N/A	N/A
Safe Practice 2: Culture Measurement, Feedback & Intervention	2019 Leapfrog Hospital Survey	2019	N/A	N/A
Safe Practice 4: Identification and Mitigation of Risks and Hazards	2019 Leapfrog Hospital Survey	2019	N/A	N/A
Safe Practice 9: Nursing Workforce	2019 Leapfrog Hospital Survey	2019	N/A	N/A
Safe Practice 19: Hand Hygiene	2019 Leapfrog Hospital Survey	2019	N/A	N/A
H-COMP-1: Nurse Communication	CMS	04/01/2018 - 03/31/2019	N/A	N/A
H-COMP-2: Doctor Communication	CMS	04/01/2018 - 03/31/2019	N/A	N/A
H-COMP-3: Staff Responsiveness	CMS	04/01/2018 - 03/31/2019	N/A	N/A

² Source AHA Annual Survey IT Supplement, Health Forum, LLC, a subsidiary of the American Hospital Association

³ Source AHA Annual Survey, Health Forum, LLC, a subsidiary of the American Hospital Association

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HOSPITAL
SAFETY GRADE

Measure Name	Primary Data Source	Reporting Period	Secondary Data Source	Reporting Period
H-COMP-5: Communication about Medicines	CMS	04/01/2018 - 03/31/2019	N/A	N/A
H-COMP-6: Discharge Information	CMS	04/01/2018 - 03/31/2019	N/A	N/A

OUTCOME MEASURES (15)				
Measure Name	Primary Data Source	Reporting Period	Secondary Data Source	Reporting Period
Foreign Object Retained	CMS	07/01/2016 - 06/30/2018	N/A	N/A
Air Embolism	CMS	07/01/2016 - 06/30/2018	N/A	N/A
Falls and Trauma	CMS	07/01/2016 - 06/30/2018	N/A	N/A
CLABSI	2019 Leapfrog Hospital Survey	07/01/2018 - 06/30/2019	CMS	04/01/2018 - 03/31/2019
CAUTI	2019 Leapfrog Hospital Survey	07/01/2018 - 06/30/2019	CMS	04/01/2018 - 03/31/2019
SSI: Colon	2019 Leapfrog Hospital Survey	07/01/2018 - 06/30/2019	CMS	04/01/2018 - 03/31/2019
MRSA	2019 Leapfrog Hospital Survey	07/01/2018 - 06/30/2019	CMS	04/01/2018 - 03/31/2019
C. Diff.	2019 Leapfrog Hospital Survey	07/01/2018 - 06/30/2019	CMS	04/01/2018 - 03/31/2019
PSI 3: Pressure Ulcer Rate	CMS	07/01/2016 - 06/30/2018	N/A	N/A
PSI 4: Death Rate among Surgical Inpatients with Serious Treatable Conditions	CMS	07/01/2016 - 06/30/2018	N/A	N/A
PSI 6: Iatrogenic Pneumothorax Rate	CMS	07/01/2016 - 06/30/2018	N/A	N/A

LEAPFROG
HOSPITAL
 SAFETY GRADE

OUTCOME MEASURES (15)				
Measure Name	Primary Data Source	Reporting Period	Secondary Data Source	Reporting Period
PSI 11: Postoperative Respiratory Failure Rate	CMS	07/01/2016 - 06/30/2018	N/A	N/A
PSI 12: Perioperative PE/DVT Rate	CMS	07/01/2016 - 06/30/2018	N/A	N/A
PSI 14: Postoperative Wound Dehiscence Rate	CMS	07/01/2016 - 06/30/2018	N/A	N/A
PSI 15: Unrecognized Abdominopelvic Accidental Puncture/Laceration Rate	CMS	07/01/2016 - 06/30/2018	N/A	N/A

MEASURE DESCRIPTIONS

PROCESS/STRUCTURAL MEASURES

For Process/Structural Measures, a higher score is always better because these are measures of compliance with best practices in patient care.

COMPUTERIZED PHYSICIAN ORDER ENTRY (CPOE)

The CPOE measure is collected by The Leapfrog Group on the Leapfrog Hospital Survey. It measures a hospital’s progress toward (1) implementing a CPOE system and (2) the ability of inpatient CPOE systems to alert prescribers to frequent serious medication errors known to cause harm to patients via the CPOE Evaluation Tool. Through participation in the Leapfrog Hospital Survey, hospitals are placed in one of several performance categories: “Fully Meets the Standard,” “Substantial Progress,” “Some Progress,” “Willing to Report,” “Declined to Respond,” or “Unable to Calculate Score.” For the purposes of calculating the Safety Grade, a numerical score is assigned to each performance category:

Leapfrog Performance Category	Measure Score
Fully Meets the Standard	100
Substantial Progress	70
Some Progress	40
Willing to Report	15
Declined to Respond	See Uses of Secondary Data
Unable to Calculate Score	Not Available (See Scoring Terms)
Pending Leapfrog Verification	Contact Leapfrog Help Desk

For hospitals that did not submit a Leapfrog Hospital Survey by November 30, see [Using Secondary Data Sources](#) for detailed information on assigning a CPOE score to hospitals using the 2018 AHA Annual Survey IT Supplement² as a secondary data source.

BAR CODE MEDICATION ADMINISTRATION (BCMA)

The BCMA measure is collected by The Leapfrog Group on the Leapfrog Hospital Survey. It measures a hospital’s progress toward 1) implementation of BCMA throughout the hospital, 2) compliance with patient and medication scans during administration, 3) use of decision support, and 4) structures to monitor and reduce workarounds. Through participation in the Leapfrog Hospital Survey, hospitals are placed in one of several performance categories: “Fully Meets the Standard,” “Substantial Progress,” “Some Progress,” “Willing to Report,” or “Declined to Respond. For the purposes of calculating the Safety Grade, a numerical score is assigned to each performance category:

Leapfrog Performance Category	Measure Score
Fully Meets the Standard	100
Substantial Progress	75
Some Progress	50
Willing to Report	25
Declined to Respond	See Uses of Secondary Data
Pending Leapfrog Verification	Contact Leapfrog Help Desk

For hospitals that did not submit a Leapfrog Hospital Survey by November 30, see [Using Secondary Data Sources](#) for detailed information on assigning a BCMA score to hospitals using the 2018 AHA Annual Survey IT Supplement² as a secondary data source.

ICU PHYSICIAN STAFFING (IPS)

The IPS measure is collected by The Leapfrog Group on the Leapfrog Hospital Survey. It measures a hospital’s use of intensivists in ICUs. Through participation in the Leapfrog Hospital Survey, hospitals are placed in one of several performance categories: “Fully Meets the Standard,” “Substantial Progress,” “Some Progress,” “Willing to Report,” or “Declined to Respond.” For the purposes of calculating the Safety Grade, a numerical score is assigned to each performance category:

Leapfrog Performance Category	Measure Score
Fully Meets the Standard	100
Substantial Progress	50
Some Progress	15
Willing to Report	5
Declined to Respond	See Uses of Secondary Data
Does Not Apply	Not Available (See Scoring Terms)
Pending Leapfrog Verification	Contact Leapfrog Help Desk

For hospitals that did not submit a Leapfrog Hospital Survey by November 30, see [Using Secondary Data Sources](#) for detailed information on assigning an IPS score to hospitals using the 2018 AHA Annual Survey³ as a secondary data source.

NQF SAFE PRACTICES

Five (5) NQF Safe Practice measures are collected by The Leapfrog Group on the Leapfrog Hospital Survey. They measure a hospital’s progress toward implementing NQF-endorsed processes and protocols to reduce and prevent adverse events. Through participation in the Leapfrog Hospital Survey, hospitals are able to earn up to 60 – 120 points for each Safe Practice. For the purposes of calculating the Safety Grade, individual scores for each Safe Practice are used:

NQF Safe Practice	Possible Measure Score
SP 1: Culture of Safety Leadership, Structures and Systems	0 - 120
SP 2: Culture Measurement, Feedback and Intervention	0 - 120
SP 4: Risks and Hazards	0 - 100
SP 9: Nursing Workforce	0 - 100
SP 19: Hand Hygiene	0 - 60

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HOSPITAL
SAFETY GRADE**

There is no secondary data source for the NQF Safe Practice Scores. Therefore, hospitals that did not submit a 2019 Leapfrog Hospital Survey by November 30 will not have these measures included in their Safety Grade and the measure will be scored as “Declined to Report.” If a hospital is missing a measure score for any measure, the standard weight of that measure is redistributed to the other measures in the same measure domain. See [Dealing with Missing Data](#) for detailed information about how the standard weight redistribution is calculated.

HOSPITAL CONSUMER ASSESSMENT OF HEALTHCARE PROVIDERS AND SYSTEMS (HCAHPS) COMPOSITES

The Hospital HCAHPS survey responses are collected by CMS via the Inpatient Quality Reporting Program. Linear mean scores calculated by CMS incorporate the full range of survey response categories into a single metric for each HCAHPS composite. Five of the six composites are used in the Safety Grade. For the purposes of calculating the Safety Grade, a hospital’s linear mean score for each of the five composites is used:

HCAHP Composite	Possible Measure Score
H-COMP-1: Nurse Communication	0 - 100
H-COMP-2: Doctor Communication	0 - 100
H-COMP-3: Staff Responsiveness	0 - 100
H-COMP-5: Communication about Medicines	0 - 100
H-COMP-6: Discharge Information	0 - 100

OUTCOME MEASURES

For Outcome Measures, a lower score is always better because these are measures of harm experienced by patients (e.g., central line-associated blood stream infections).

HEALTHCARE-ASSOCIATED INFECTIONS

Five healthcare-associated infection measures are collected by The Leapfrog Group on the Leapfrog Hospital Survey: Central line-associated bloodstream infections (CLABSI) in ICUs and select wards, Catheter-associated urinary tract infections (CAUTI) in ICUs and select wards, Surgical site infections from colon surgery (SSI: Colon), Facility-wide inpatient MRSA Blood Laboratory-identified Events, and Facility-wide inpatient C.diff. Laboratory-identified Events. Through participation in the Leapfrog Hospital Survey, hospitals were required to 1) join Leapfrog’s NHSN group, 2) provide an accurate NHSN ID in the Profile section of the Online Survey Tool, and 3) submit Section 7 Managing Serious Errors by November 30. For the purposes of calculating the Safety Grade, the [standardized](#)

LEAPFROG
HOSPITAL
SAFETY GRADE

[infection ratio \(SIR\)](#) is used:

As Reported by Leapfrog	Measure Score	Notes
Standardized Infection Ratio (SIR)	SIR	Measure is included in calculating the Safety Grade
Does Not Apply	Not Available (See Scoring Terms)	Measure is not included in calculating the Safety Grade. No use of Secondary Data.
Unable to Calculate Score	Not Available (See Scoring Terms)	Measure is not included in calculating the Safety Grade. No use of Secondary Data.
Declined to Respond	See Uses of Secondary Data	Secondary Data source is used .

For hospitals that did not submit a Leapfrog Hospital Survey by November 30, see [Using Secondary Data Sources](#) for detailed information on assigning HAI scores to hospitals using CMS as a secondary data source.

HOSPITAL-ACQUIRED CONDITIONS

Three hospital-acquired condition measures are calculated by CMS through the [DRA HAC Reporting Program](#): Foreign Object Retained after Surgery, Air Embolism, and Falls and Trauma. Hospital-acquired condition rates are calculated by CMS based on Medicare Fee-for-Service claims and publicly reported as a rate per 1,000 inpatient discharges. For the purposes of calculating the Safety Grade, the rate is used.

AHRQ PATIENT SAFETY INDICATORS (PSIS)

Seven AHRQ Patient Safety Indicators are calculated by CMS through the [Inpatient Quality Reporting and the HAC Reduction Programs](#): PSI 3 Pressure Ulcer Rate; PSI 4 Death Rate among Surgical Inpatients with Serious Treatable Conditions; PSI 6 Iatrogenic Pneumothorax Rate; PSI 11 Postoperative Respiratory Failure Rate; PSI 12 Perioperative PE/DVT Rate; PSI 14 Postoperative Wound Dehiscence Rate; and PSI 15 Unrecognized Abdominopelvic Accidental Puncture/Laceration Rate. PSI rates are calculated by CMS based on Medicare Fee-for-Service claims and publicly reported as a rate per 1,000 inpatient discharges. For the purposes of calculating the Safety Grade, the rate is used.

USING SECONDARY DATA SOURCES

Thirteen (13) of the 28 measures included in the Safety Grade are derived from the Leapfrog Hospital Survey. The Leapfrog Hospital Survey is voluntary, and as such, hospitals may choose not to submit a Survey. To address this gap in available data, the Safety Grade methodology utilizes secondary data when available. This section describes the methods developed for using secondary data sources and dealing with missing data. For information on how to complete a free Leapfrog Hospital Survey, visit www.leapfroggroup.org/survey.

COMPUTERIZED PHYSICIAN ORDER ENTRY (CPOE)

The 2018 AHA Annual Survey IT Supplement² is the **secondary data source** for CPOE. For the purposes of calculating the Safety Grade, a hospital’s response to the question regarding the use of Computerized Provider Order Entry (CPOE) for medications is used to assign the following score (refer to Table 1):

Table 1 Points Earned for Hospitals That Did Not Submit a 2019 Leapfrog Hospital Survey by November 30, 2019

2018 AHA Annual Survey IT Supplement Response	Measure Score	Notes
1 – Yes	45	Score reflects the information regarding CPOE available from the secondary data source when compared to the Leapfrog Hospital Survey. See details regarding Leapfrog’s CPOE standard.
2 – No	5	
3 – Do Not Know	Declined to Report	

If a hospital did not report to the Leapfrog Hospital Survey or AHA Annual Survey IT Supplement² on their CPOE implementation, the hospital receives a score of, and is publicly reported as, “Declined to Report.” This measure is then **not included** in calculating the Safety Grade. If a hospital is missing a measure score for any measure, the standard weight of that measure is redistributed to the other measures in the same measure domain. See [Dealing with Missing Data](#) for detailed information about how the standard weight redistribution is calculated.

BAR CODE MEDICATION ADMINISTRATION (BCMA)

The 2018 AHA Annual Survey IT Supplement² is the **secondary data source** for BCMA. For the purposes of calculating the Safety Grade, a hospital’s response to the question regarding the use of Bar Coding or Radio Frequency Identification (RFID) for Closed-loop Medication Tracking is used to assign the following score (refer to table 2):

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SAFETY GRADE**

Table 2 Points Earned for Hospitals That Did Not Submit a 2019 Leapfrog Hospital Survey by November 30, 2019

2018 AHA Annual Survey IT Supplement Response	Measure Score	Notes
1 – Yes	45	Score reflects the information regarding BCMA available from the secondary data source when compared to the Leapfrog Hospital Survey. See details regarding Leapfrog’s CPOE standard.
2 – No	5	
3 – Do Not Know	Declined to Report	

If a hospital did not report to the Leapfrog Hospital Survey or AHA Annual Survey IT Supplement² on their BCMA implementation, the hospital receives a score of, and is publicly reported as, “Declined to Report.” This measure is then **not included** in calculating the Safety Grade. If a hospital is missing a measure score for any measure, the standard weight of that measure is redistributed to the other measures in the same measure domain. See [Dealing with Missing Data](#) for detailed information about how the standard weight redistribution is calculated.

ICU PHYSICIAN STAFFING (IPS)

The 2018 AHA Annual Survey³ is the **secondary data source** for IPS. For the purposes of calculating the Hospital Safety Grade, a hospital’s responses to the 2018 AHA Annual Survey³ questions on the number of Med/Surg and/or Pediatric ICU beds, the closed/open status of the Med/Surg ICU and/or Pediatric ICUs, and number of FTEs of intensivists in Med/Surg and/or Pediatric ICUs are used to assign the following measure score (refer to Table 3):

Note 1: If a hospital reported zero (0) Med/Surg **AND** zero (0) Pediatric ICU beds, the hospital will receive a score of “Not Available” and this measure will not be included in calculating the Leapfrog Hospital Safety Grade.

Table 3 Points Earned for IPS for Hospitals That Did Not Submit a 2019 Leapfrog Hospital Survey by November 30, 2019

2018 AHA Annual Survey Response	Measure Score	Notes
If Med/Surg ICU is “Closed” and the number of intensivist FTEs is >6	85	Score was imputed based on an analysis comparing hospital performance on Leapfrog and AHA surveys
If Med/Surg ICU is “Closed” and the number of intensivist FTEs is <=6 and >0	65	Score was imputed based on an analysis comparing hospital performance on Leapfrog and AHA surveys
If Med/Surg ICU is “Open”	5	
If Pediatric ICU is “Closed” and the number of intensivist FTEs is >6	85	Score was imputed based on an analysis comparing hospital performance on Leapfrog and AHA surveys
If Pediatric ICU is “Closed” and the number of intensivist FTEs is <=6 and >0	65	Score was imputed based on an analysis comparing hospital performance on Leapfrog and AHA surveys
If Pediatric ICU is “Open”	5	

LEAPFROG HOSPITAL SAFETY GRADE

If Med/Surg ICU beds and Pediatric ICU beds is 0	Not Available (See Scoring Terms)	Measure is not included in calculating the Leapfrog Hospital Safety Grade.
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EXAMPLE 1:

Med/Surg ICU is closed and staffed with 10 FTEs = 85
 Pediatric ICU is open and staffed with 6 FTEs = 5
 Overall IPS Score calculation: $85 + 5 = 90 / 2 = 45$
Overall IPS Score used to calculate Leapfrog Hospital Safety Grade = 45

EXAMPLE 2:

Med/Surg ICU is closed and staffed with 20 FTEs = 85
 Pediatric ICU is closed and staffed with 5 FTEs = 65
 Overall IPS Score calculation: $85 + 65 = 150 / 2 = 75$
Overall IPS Score used to calculate Leapfrog Hospital Safety Grade = 75

If a hospital did not report to the Leapfrog Hospital Survey or AHA Annual Survey³ on ICU Physician Staffing, the hospital receives a score of, and is publicly reported as, “Declined to Report.” This measure is **not included** in calculating the Safety Grade. If a hospital is missing a measure score for any measure, the standard weight of that measure is redistributed to the other measures in the same measure domain. See [Dealing with Missing Data](#) for detailed information about how the standard weight redistribution is calculated.

HEALTHCARE-ASSOCIATED INFECTIONS

CMS is the **secondary data** source for healthcare-associated infections. For the purposes of calculating the Safety Grade, the standardized infection ratio (SIR) published by CMS is used (refer to Table 4):

Table 4 Hospitals That Did Not Submit a 2019 Leapfrog Hospital Survey by November 30, 2019

As Reported by CMS	Measure Score	Notes
Not Available (no locations or low volume)	Not Available	Measure is not included in calculating the Leapfrog Hospital Safety Grade.
Standard Infection Ratio (SIR)	SIR	Measure is included in calculating the Leapfrog Hospital Safety Grade.

If a hospital does not have available data from The Leapfrog Hospital Survey or CMS (e.g., no locations or low volume), the hospital receives a score of, and is publicly reported as, “Not Available.” This measure is not included in calculating the Safety Grade. If a hospital is missing a measure score for any measure, the standard weight of that measure is redistributed to the other measures in the same measure domain. See [Dealing with Missing Data](#) for detailed information about how the standard weight redistribution is calculated.

WEIGHTING INDIVIDUAL MEASURES

Each measure included in the Leapfrog Hospital Safety Grade is assigned a standard weight. The methodology to assign standard weights includes three criteria that reflect the quality of the measure. These criteria are: (1) Impact, (2) Evidence, and (3) Opportunity. These three (3) criteria are then combined using the following equation to compute a standard weight for each measure that represents the measure's relative importance within the composite score: **[Evidence + (Opportunity x Impact)]**.

EVIDENCE

The Evidence Score for each individual measure is assigned a value of one (1) or two (2) using the following criteria:

- 1 = Supported by either suggestive clinical or epidemiological studies or theoretical rationale
- 2 = Supported by experimental, clinical, or epidemiological studies and strong theoretical rationale

OPPORTUNITY

The Opportunity Score for each individual measure is based on the Coefficient of Variation (Standard Deviation/Mean) of that measure, using the following formula: **[1 + (Standard Deviation/Mean)]**. The Opportunity Score is on a continuous scale that is capped at three (3). Any measure with an Opportunity Score above three (3) is assigned a three (3).

IMPACT

The Impact Score for each individual measure is comprised of two (2) parts, each of which is assigned a value from one (1) to three (3):

1. Number of patients affected
2. Severity of harm

The *number of patients affected* score is determined by the following:

- 0 = Extremely rare event (e.g., Air Embolism)
- 1 = Rare event (e.g., Foreign Object Retained After Surgery)
- 2 = Some patients in hospital affected (e.g., ICU Physician Staffing)

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- 3 = All patients in hospital affected (e.g., Hand Hygiene Safe Practice)

The *severity of harm* score is determined by the following:

- 1 = No direct evidence of harm or harm reduction (e.g., Hand Hygiene Safe Practice)
- 2 = Clear documentation of harm or harm reduction; adverse events (e.g., Foreign Object Retained After Surgery)
- 3 = Significant mortality reduction (more than 1,000 deaths or a 10% reduction in hospital wide mortality) (e.g., ICU Physician Staffing)

The values from each part are then added together to arrive at the overall Impact Score using the following criteria:

- 1 = Score of 2 (Low Impact)
- 2 = Score of 3-4 (Medium Impact) (e.g., Foreign Object Retained After Surgery; Hand Hygiene Safe Practice)
- 3 = Score of 5-6 (High Impact) (e.g., ICU Physician Staffing)

SPRING 2020 STANDARD MEASURE WEIGHTS

Measure	Evidence Score	Opportunity Score	Impact Score	Standard Measure Weight
Process/Structural Measure Domain (50%)				
CPOE	2	1.34	3	5.7%
BCMA	2	1.29	3	5.6%
IPS	2	1.77	3	7.0%
SP 1	1	1.06	2	3.0%
SP 2	1	1.09	2	3.0%
SP 4	1	1.08	2	3.0%
SP 9	1	1.07	3	4.0%
SP 19	2	1.12	2	4.0%
H-COMP-1	1	1.02	2	2.9%
H-COMP-2	1	1.02	2	2.9%
H-COMP-3	1	1.04	2	2.9%
H-COMP-5	1	1.04	2	2.9%
H-COMP-6	1	1.04	2	2.9%
Outcome Measure Domain (50%)				
HAC: Foreign Object	1	3.00	2	4.3%
HAC: Air Embolism	1	3.00	1	2.5%
HAC: Falls and Trauma	2	1.80	3	4.5%
CLABSI	2	1.83	3	4.6%
CAUTI	2	1.73	3	4.4%
SSI: Colon	2	1.80	2	3.4%
MRSA	2	1.80	3	4.5%
C. Diff.	2	1.58	3	4.1%
PSI 3	1	1.87	3	4.1%
PSI 4	1	1.12	2	2.0%
PSI 6	1	1.21	2	2.1%
PSI 11	1	1.35	2	2.3%
PSI 12	1	1.26	2	2.2%
PSI 14	1	1.17	2	2.1%
PSI 15	1	1.25	3	2.9%

SCORING METHODOLOGY

Once each available measure score is collected from the sources described above, the Safety Grade is calculated using the methodology described below.

CALCULATING Z-SCORES

Z-Scores are used to standardize data from measures with different performance scales and allow for comparisons (e.g., a linear mean score of 91 on H-COMP-1: Nurse Communication and a CLABSI SIR of 0.87). In addition, Z-Scores can indicate to a hospital whether their measure score is above, below, or equal to the average hospital.

In the Scoring Methodology, a Z-Score is calculated for each available measure score. A Z-Score is calculated using a hospital's actual measure score, the national mean for that measure, and the standard deviation for that measure. The Z-Score for each measure is calculated using the following formulas:

- **For Process/Structural Measures: $[\text{Hospital Score} - \text{Mean}] / \text{Standard Deviation}$**
- **For Outcome Measures: $[(\text{Mean} - \text{Hospital Score}) / \text{Standard Deviation}]$**

The following table includes the national mean and standard deviation for each measure. These values are used to calculate a hospital's Z-Score using the formulas above. Please note, for display, means and standard deviations shown below are rounded to two or three decimal places. For scoring, these values are not rounded.

Process and Structural Measures	Mean	Standard Deviation
Computerized Physician Order Entry (CPOE)	79.13	26.55
Bar Code Medication Administration (BCMA)	82.28	24.22
ICU Physician Staffing (IPS)	57.55	44.10
Safe Practice 1: Leadership Structures and Systems	117.44	7.31
Safe Practice 2: Culture Measurement, Feedback & Intervention	117.13	11.00
Safe Practice 4: Identification and Mitigation of Risks and Hazards	97.86	7.94
Safe Practice 9: Nursing Workforce	98.22	7.16
Safe Practice 19: Hand Hygiene	57.60	7.04

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HOSPITAL
SAFETY GRADE

Process and Structural Measures	Mean	Standard Deviation
H-COMP-1: Nurse Communication	91.04	2.14
H-COMP-2: Doctor Communication	90.93	1.97
H-COMP-3: Staff Responsiveness	84.39	3.47
H-COMP-5: Communication about Medicines	77.87	3.47
H-COMP-6: Discharge Information	86.53	3.16

Outcome Measures	Mean	Standard Deviation
Foreign Object Retained	0.02	0.06
Air Embolism	0.001	0.01
Falls and Trauma	0.44	0.35
CLABSI	0.70	0.58
CAUTI	0.77	0.57
SSI: Colon	0.81	0.65
MRSA	0.82	0.66
C. Diff.	0.63	0.36
PSI 3: Pressure Ulcer Rate	0.49	0.42
PSI 4: Death Rate among Surgical Inpatients with Serious Treatable Conditions	162.89	19.36
PSI 6: Iatrogenic Pneumothorax Rate	0.27	0.06
PSI 11: Postoperative Respiratory Failure Rate	7.67	2.69
PSI 12: Perioperative PE/DVT Rate	3.83	1.00
PSI 14: Postoperative Wound Dehiscence Rate	0.95	0.16
PSI 15: Unrecognized Abdominopelvic Accidental Puncture/Laceration Rate	1.29	0.32

A NOTE ABOUT NEGATIVE Z-SCORES

To ensure that a single measure does not dominate a hospital’s overall score in an unintended way, Leapfrog caps negative Z-scores at -5.00. Hospitals that have a calculated Z-score below -5.00 on a measure will receive a modified Z-score of -5.00 on that measure.

A NOTE ABOUT EXTREME VALUES

For hospitals that have an “extreme” value for a particular measure (i.e. a value that exceeds the 99th percentile) Leapfrog “trims” the reported value to the 99th percentile. For example, a rate of 0.50 per 1,000 patient discharges for Foreign Object Retained after Surgery is “trimmed” to 0.362 (e.g. the 99th percentile). Only “trimmed” rates are displayed on the Leapfrog Hospital Safety Grade [website](#). Please see the table below for a list of the “trim” values for the Spring 2020 Leapfrog Hospital Safety Grade.

Measure	99 th Percentile
Foreign Object Retained after Surgery	0.362
Falls and Trauma	1.625
CLABSI	2.673
CAUTI	2.796
SSI: Colon	2.922
MRSA	3.213
C. Diff.	1.865
PSI 3: Pressure Ulcer Rate	2.35
PSI 4: Death Rate among Surgical Inpatients with Serious Treatable Conditions	215.45
PSI 6: Iatrogenic Pneumothorax Rate	0.48
PSI 11: Postoperative Respiratory Failure Rate	16.47
PSI 12: Perioperative PE/DVT Rate	7.24
PSI 14: Postoperative Wound Dehiscence Rate	1.51
PSI 15: Unrecognized Abdominopelvic Accidental Puncture/Laceration Rate	2.4

Note 1: Percentiles are rounded to reflect the precision of the raw data.

DEALING WITH MISSING DATA

Due to a variety of reasons, a hospital may not have a measure score for all 28 measures. If a hospital is missing a measure score for any measure, the standard weight of that measure is redistributed to the other measures in the same measure domain. The new weight for each measure within the domain is calculated by re-apportioning the standard weight assigned to the measure with the missing score to other measures within the same domain.

For example, if a hospital is missing a measure score for ICU Physician Staffing because the hospital does not operate an adult or pediatric medical and/or surgical ICU, the standard weight of 7.0% will be re-apportioned to the remaining 12 measures within the process/structural measure domain.

To calculate the new weight of each of the remaining 12 measures in the process/structural measure domain, hospitals can use the formula below or use the Leapfrog Hospital Safety Grade Calculator ©, which can be found on the [Safety Grade Review Website](#). Note that each domain contributes to 50% of the overall letter grade.

*[Standard measure weight / (sum of standard weights for the remaining 12 measures in the process/structural measure domain)]*50% = updated measure weight*

For more information about how the measure weight redistribution is calculated and affects the overall score, please see the Leapfrog Hospital Safety Grade Calculator, which can be found on the last page of the [Safety Grade Review Website](#).

CALCULATING WEIGHTED MEASURE SCORES

To calculate a hospital's numerical safety score, multiply the Z-Score of each process/structural measure by the standard weight assigned to that measure to get the weighted process/structural measure score. If a hospital is missing any process/structural measure scores, see [Dealing with Missing Data](#) to determine the updated measure weight. Then, sum all weighted process/structural measure scores. This is the hospital's overall weighted process/structural measures score.

Multiply the Z-Score of each outcome measure by the standard weight assigned to that measure to get the weighted outcome measure score. If a hospital is missing any outcome measure scores, see [Dealing with Missing Data](#) to determine the updated measure weight. Then, sum all weighted outcome measure scores. This is the hospital's overall weighted outcome measures score.

To calculate the overall Safety Grade for a hospital, add the overall weighted process/structural measure score and the overall weighted outcome measures score. Add 3.0 to your score; this is done to normalize scores to a positive distribution. This final numerical score (typically between 1.0 and 4.0) is then assigned to a letter grade. To assist hospitals in calculating their numerical score, a calculator is available on the [Safety Grade Review Website](#).

ADDITIONAL SCORING INFORMATION

TERMS USED IN SCORING AND PUBLIC REPORTING

“Not Available” means that the hospital does not have a score for this measure. This could be because the measure is related to a service the hospital does not provide or because the hospital had too few patients or cases to report data for a condition or procedure. A “Not Available” result does not mean that the hospital withheld information from the public.

“Declined to Report” means that a hospital did not voluntarily provide information to the Leapfrog Hospital Survey and/or the AHA Annual Survey and/or the AHA IT Supplement. Measures scored as “Declined to Report” will not be used in calculating the overall score (see [Dealing with Missing Data](#)).

SHARED CMS CERTIFICATION NUMBERS

All hospitals that share a CMS Certification Number (CCN) will be assigned the same source data as reported by CMS. Affected measures include the HCAHPS, Hospital-Acquired Conditions, Healthcare-Associated Infections (if secondary data source is used), and Patient Safety Indicators.

UPDATES TO DATA USED IN THE LEAPFROG HOSPITAL SAFETY GRADE

The Leapfrog Hospital Safety Grade relies on publicly available data that hospitals have had the opportunity to review for accuracy. Therefore, Leapfrog does not allow hospitals to make updates to their data following the Data Snapshot Date. In January of each year, Leapfrog publishes the Data Snapshot Dates for each of the two Leapfrog Hospital Safety Grade public releases at <http://www.hospitalsafetygrade.org/for-hospitals/updates-and-timelines-for-hospitals>. Leapfrog publishes these dates to give hospitals and other stakeholders advance notice so they can be prepared to submit a Leapfrog Hospital Survey, submit an AHA Annual Survey³ and/or AHA Annual Survey IT Supplement², and track and review their performance on CMS measures used in the Safety Grade.

In addition, Leapfrog holds a courtesy three-week Safety Grade Review Period to give hospitals an additional opportunity to review the data that will be used to calculate their hospital's Safety Grade. During the three-week review period, if a hospital finds a data discrepancy (i.e. the measure score on the public report does not match the measure score on the review website) the hospital should contact the Help Desk immediately. Hospitals should double check the data source, measure name, and reporting period before contacting the Help Desk. The Help Desk will need to know which measure and score are in question and will need a copy of the public report that shows a different score than the one Leapfrog has recorded on the [Safety Grade Review Website](#).

Please review the details below which describe Leapfrog's policy for accepting corrections from data sources used in the Leapfrog Hospital Safety Grade after the Data Snapshot Date.

DATA FROM THE LEAPFROG HOSPITAL SURVEY

During the three-week Safety Grade Review Period (February 18 – March 9), Leapfrog will only make corrections to a hospital's data from the Leapfrog Hospital Survey if a recording error is identified (i.e. we have recorded a different measure score than what is posted on our Survey Results website) or a scoring error is identified (i.e. Leapfrog has calculated an incorrect measure score based on the submitted responses and Leapfrog's published scoring algorithms). Updates to Leapfrog Hospital Survey data that are submitted after the Data Snapshot Date will **not** be included in the current Leapfrog Hospital Safety Grade. Hospitals submitting a Leapfrog Hospital Survey are urged to take advantage of the opportunity to review their Survey Results for accuracy and completeness prior to each of the two published Data Snapshot Dates.

HOW HOSPITALS CAN REVIEW LEAPFROG HOSPITAL SURVEY RESULTS PRIOR TO THE DATA SNAPSHOT DATE

The Leapfrog Hospital Survey is open from April 1 to November 30 of each year. Following the first reporting deadline (August 31), Survey Results are published monthly on a secure ‘Hospital Details’ page and a public website (www.leapfroggroup.org/compare-hospitals). Hospitals are urged to review their Survey Results. Hospitals that identify any reporting errors are instructed to log back into the Survey to submit a correction. Hospitals are able to correct and re-submit a previously submitted Survey until the Survey closes for the year. Note that corrections submitted after the Data Snapshot Date are not included in the current Leapfrog Hospital Safety Grade. Leapfrog has several automated processes in place to prevent hospitals from making data entry errors in the Online Survey Tool and to enhance the overall accuracy of the Survey Results. Learn more at <http://www.leapfroggroup.org/survey-materials/data-accuracy>

DATA FROM THE AHA ANNUAL SURVEY OR AHA ANNUAL SURVEY IT SUPPLEMENT

During the three-week Safety Grade Review Period (February 18 – March 9), Leapfrog will only make corrections to a hospital’s data from the AHA Health Forum if the correction is issued to all individuals and organizations who license the AHA Annual Survey³ and/or AHA Annual Survey IT Supplement² data. Hospitals submitting an Annual Survey or IT supplement to the AHA Health Forum are urged to take advantage of the opportunity to review their survey results for accuracy and completeness prior to and immediately following survey submission.

In addition, if Leapfrog identifies reporting scenarios which are logically inconsistent and therefore a likely reporting error with respect to a hospital’s ICU Physician Staffing data from the AHA Annual Survey³, this data will not be used in calculating the Leapfrog Hospital Safety Grade. Examples of reporting scenarios that will result in ICU Physician Staffing data not being used are listed below:

EXAMPLES OF REPORTING ERRORS THAT WILL NOT BE USED IN THE LEAPFROG HOSPITAL SAFETY GRADE

Med/Surg ICU Data	Pediatric ICU Data
Zero (0) Med/Surg ICU beds and greater than zero (0) Med/Surg Intensivist FTE	Zero (0) Pediatric ICU beds and greater than zero (0) Pediatric Intensivist FTE
Zero (0) Med/Surg ICU beds and a ‘closed’ Med/Surg ICU	Zero (0) Pediatric ICU beds and a ‘closed’ Pediatric ICU
A ‘closed’ Med/Surg ICU and zero (0) Med/Surg Intensivist FTEs	A ‘closed’ Pediatric ICU and zero (0) Pediatric Intensivist FTEs

HOW HOSPITALS CAN REVIEW AHA ANNUAL SURVEY AND IT SUPPLEMENT SUBMISSIONS PRIOR TO THE DATA SNAPSHOT DATE

The American Hospital Association's (AHA) Annual Survey and AHA Annual Survey IT Supplement² are administered by the AHA Health Forum. Both online and paper submissions are accepted. Online surveys are run through electronic data evaluation routines designed to test the reliability and validity of reported survey values prior to the electronic submission of the completed survey to the AHA. Error checks fall into two categories: (a) compares the hospital's current year response against its response to the same question last year and (b) tests for the internal consistency of related questions across the survey. Where a value fails any test, an error message is immediately returned to the respondent requesting that it either corrects the questionable value or explains in text format why the value is correct. A participant hospital can review its response and make as many changes as many times as deemed necessary prior to final submission. In addition, AHA data analysts apply an even larger version of the routine error checks to all submitted data regardless of online or paper submission. The AHA data analysts review potential problems in the last processing step prior to finalization. A responding hospital is free to modify its submitted survey up until the close of the data collection and data evaluation phases of the Annual Survey process. To correct a survey, hospitals must contact the Health Forum survey support facility.

DATA FROM THE CENTERS FOR MEDICARE & MEDICAID SERVICES (CMS)

During the three-week Safety Grade Review Period (February 18 – March 9), Leapfrog will only make corrections to a hospital's data from CMS if the correction is issued by CMS and posted on either the [Data.Medicare.Gov](https://data.cms.gov) website or the [Data.CMS.Gov](https://data.cms.gov) website. If a hospital has identified an error with a measure score published by CMS, and CMS cannot post a correction within the three-week review period, the measure score will not be used in calculating the hospital's Safety Grade, provided that the hospital can document that CMS has agreed to publicly issue a correction or remove the measure score from public reporting. Hospitals participating with CMS are urged to take advantage of the opportunity to participate in the CMS 30-day review periods.

HOW HOSPITALS CAN REVIEW CMS DATA PRIOR TO THE DATA SNAPSHOT DATE

CMS administers several hospital-based reporting and payment programs including the Inpatient Quality Reporting Program, HAC Reduction Program, and Value-based Purchasing Program. Several measures collected and calculated by CMS via its various hospital-based programs are used in the Leapfrog Hospital Safety Grade. CMS provides hospitals with a 30-day preview period before publishing measure scores on the [Data.Medicare.Gov](https://data.cms.gov) website and the [Data.CMS.Gov](https://data.cms.gov) website. More information is available at <https://qualitynet.org>.



HOW TO PARTICIPATE IN THE LEAPFROG HOSPITAL SURVEY

If a hospital did **not** complete a 2019 Leapfrog Hospital Survey by November 30, results from the Survey were not used to calculate the Leapfrog Hospital Safety Grade. Leapfrog will update Leapfrog Hospital Safety Grades again in the fall of 2020. If a hospital would like Leapfrog Hospital Survey Results included in the next Leapfrog Hospital Safety Grade, a 2020 Leapfrog Hospital Survey **must be submitted by August 31, 2020**. For more information about the Leapfrog Hospital Survey, visit <https://www.leapfroggroup.org/survey>.

LEAPFROG HELP DESK

If you have any questions regarding the scoring methodology, please contact the Help Desk at <https://leapfroghelpdesk.zendesk.com>.