LEAPFROG
HOSPITAL
SAFETY GRADE

Scoring Methodology

FALL 2019

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WHAT IS THE HOSPITAL SAFETY GRADE?

Leapfrog Hospital Safety Grades (formerly known as Hospital Safety Scores) 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 Leapfrog Hospital Safety Grade uses national performance measures from the Centers for Medicare & Medicaid Services (CMS), the Leapfrog Hospital Survey and other supplemental data sources.

Taken together, those performance measures produce a single letter grade representing a hospital's overall performance in keeping patients safe from preventable harm and medical errors. The Safety Grade includes 28 measures, all currently in use by national measurement and reporting programs. The Leapfrog Hospital Safety Grade methodology has been peer reviewed and published in the Journal of Patient Safety.[1]

With the Leapfrog Hospital 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 grade will foster strong market incentives for hospitals to make safety a priority. Leapfrog Hospital Safety Grades are publicly reported at www.HospitalSafetyGrade.org.

ELIGIBLE HOSPITALS

The Leapfrog Group calculates a Safety Grade for over 2,600 general acute care hospitals for which there is sufficient publicly available data. Because publicly available data is limited for a variety of reasons, Leapfrog is not able to calculate a Safety Grade for every hospital in the U.S.

The Leapfrog Group is not able to calculate a Leapfrog Hospital Safety Grade for the following types of hospitals due to missing data:

- Critical access hospitals (CAH)
- Long-term care and rehabilitation facilities
- Mental health facilities
- Federal hospitals (e.g., Veterans Affairs, Indian Health Services, etc.)
- Specialty hospitals, including surgical centers and cancer hospitals

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

- Free-standing pediatric hospitals
- Hospitals in U.S. territories
- Hospitals that are missing measure scores for **more than seven** (7) process/structural measures or **more than five** (5) outcome measures

MEASURES

The Leapfrog Hospital Safety Grade utilizes 28 national performance measures of patient safety that are collected and publicly reported by The Leapfrog Group and the Centers for Medicare & Medicaid Services (CMS) to produce a single composite score that represents a hospital's overall performance in keeping patients safe from preventable harm and medical errors. In addition, supplemental data from a secondary data source, the American Hospital Association (AHA), is used to give hospitals as much credit as possible towards their Safety Grades.

The measure set is divided into two domains: (1) Process/Structural Measures and (2) Outcome Measures. Each domain represents 50% of the Leapfrog Hospital 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.

PROCESS AND STRUCTURAL MEASURES (13)				
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	2017 AHA Annual Survey Database [3]	2017

[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

LEAPFROG HOSPITAL SAFETY GRADE

PROCESS AND STRUCTURAL MEASURES (13)				
Measure Name	**Primary Data Source**	**Reporting Period**	**Secondary Data Source**	**Reporting Period**
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	10/01/2017 - 09/30/2018	N/A	N/A
H-COMP-2: Doctor Communication	CMS	10/01/2017 - 09/30/2018	N/A	N/A
H-COMP-3: Staff Responsiveness	CMS	10/01/2017 - 09/30/2018	N/A	N/A
H-COMP-5: Communication about Medicines	CMS	10/01/2017 - 09/30/2018	N/A	N/A
H-COMP-6: Discharge Information	CMS	10/01/2017 - 09/30/2018	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	01/01/2018 - 12/31/2018	CMS	10/01/2017 - 09/30/2018
CAUTI	2019 Leapfrog Hospital Survey	01/01/2018 - 12/31/2018	CMS	10/01/2017 - 09/30/2018
SSI: Colon	2019 Leapfrog Hospital Survey	01/01/2018 - 12/31/2018	CMS	10/01/2017 - 09/30/2018
MRSA	2019 Leapfrog Hospital Survey	01/01/2018 - 12/31/2018	CMS	10/01/2017 - 09/30/2018
C. Diff.	2019 Leapfrog Hospital Survey	01/01/2018 - 12/31/2018	CMS	10/01/2017 - 09/30/2018
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
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 efficacy of that system in alerting prescribers to common medication errors such as drug-drug interactions and drug-allergy interactions via the CPOE Evaluation Tool. CPOE is a categorical measure: hospitals receive either "Fully Meets the Standard," "Substantial Progress," "Some Progress," "Willing to Report," "Declined to Respond," or "Unable to Calculate Score" based on the information they submit via the Leapfrog Hospital Survey. A numerical score is assigned to each performance category from the Leapfrog Hospital Survey for the purposes of calculating a Hospital Safety Grade:

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 August 31, see Using Secondary Data Sources for detailed information on assigning a CPOE score to hospitals using the 2018 AHA Annual Survey IT Supplement[2] 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) types of decision support that the hospital's BCMA system offers and 4) structures to monitor and reduce workarounds. BCMA is a categorical measure: hospitals receive either "Fully Meets the Standard," "Substantial Progress," "Some Progress," "Willing to Report," "Declined to Respond," or "Does Not Apply" based on the information they submit via the Leapfrog Hospital Survey. A numerical score is assigned to each performance category from the Leapfrog Hospital Survey for the purposes of calculating a Hospital Safety Grade:

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 August 31, see Using Secondary Data Sources for detailed information on assigning a BCMA score to hospitals using the 2018 AHA Annual Survey IT Supplement[2] 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. IPS is a categorical measure: hospitals receive either "Fully Meets the Standard," "Substantial Progress," "Some Progress," "Willing to Report," "Declined to Respond," or "Does Not Apply" based on the information they submit via the Leapfrog Hospital Survey. A numerical score is assigned to each performance category from the Leapfrog Hospital Survey for the purposes of calculating a Hospital Safety Grade:

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 August 31, see Using Secondary Data Sources for detailed information on assigning an IPS score to hospitals using the 2017 AHA Annual Survey[3] as a secondary data source.

NQF SAFE PRACTICE SCORES

Five (5) NQF Safe Practice measures are collected by The Leapfrog Group on the Leapfrog Hospital Survey. They measure a hospital's progress in implementing NQF-endorsed processes and protocols that promote safe patient care. The maximum possible score for each NQF Safe Practices ranges from 60 – 120. Individual scores for each Safe Practice are used to calculate the Leapfrog Hospital Safety Grade.

Leapfrog Performance Category	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

There is no secondary data source for the NQF Safe Practice Scores. Therefore, hospitals that did not submit a 2019 Leapfrog Hospital Survey by August 31 will not have these measures included in their Safety Grade and the measure will be scored as "Declined to Report".

HOSPITAL CONSUMER ASSESSMENT OF HEALTHCARE PROVIDERS AND SYSTEMS (HCAHPS) LINEAR MEAN SCORES

The Centers for Medicare & Medicaid Services (CMS), along with the Agency for Healthcare Research and Quality (AHRQ), developed the HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems) Survey, also known as Hospital CAHPS®, to provide a standardized survey instrument and data collection methodology for measuring patients' perspectives on hospital care. The HCAHPS Survey is administered to a random sample of patients continuously throughout the year. CMS cleans, adjusts and analyzes the data, then publicly reports the results. Five of the seven composite topics are used in the Leapfrog Hospital Safety Grade. The composite topic linear mean score for each measure is calculated by CMS.

HCAHP Composite Topic	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

The Leapfrog Hospital Safety Grade includes five (5) healthcare-associated infection measures collected 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. 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 August 31.

The standardized infection ratio (SIR) for each infection measure is used to calculate the Leapfrog Hospital Safety Grade. Information regarding the CDC's SIR methodology can be found at http://www.cdc.gov/nhsn/acute-care-hospital/index.html.

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

HOSPITAL-ACQUIRED CONDITION (HAC) RATES

The Leapfrog Hospital Safety Grade contains three (3) measures of Hospital-Acquired Conditions: Foreign Object Retained after Surgery, Air Embolism, and Falls/Trauma. CMS calculates these rates based on the claims it receives from hospitals that participate in the Inpatient Prospective Payment System (IPPS). The HAC measures are reported as a rate per 1,000 inpatient discharges by CMS, where zero is the best possible rate. This rate is used to calculate the Leapfrog Hospital Safety Grade.

AHRQ PATIENT SAFETY INDICATOR (PSI) RATES

The Leapfrog Hospital Safety Grade contains seven (7) AHRQ Patient Safety Indicators: 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.

CMS calculates these rates based on the claims it receives from hospitals that participate in the Inpatient Prospective Payment System (IPPS). The PSIs are reported as a rate per 1,000 patient discharges by CMS. This rate is used to calculate the Hospital Safety Grade.

USING SECONDARY DATA SOURCES

Thirteen (13) of the 28 measures that make up the Leapfrog Hospital Safety Grade are derived from the 2019 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 Leapfrog Hospital 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 Leapfrog Hospital Survey is the **primary data source** for CPOE. Hospitals that report their progress in meeting the CPOE Standard on the 2019 Leapfrog Hospital Survey by August 31, 2019 will receive a measure score based on their Leapfrog performance for the CPOE measure.

The 2018 AHA Annual Survey IT Supplement[2] is the **secondary data source** for CPOE. 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 1.1).

Table 1.1 Points Earned for Hospitals That Did Not Submit a 2019 Leapfrog Hospital Survey by August 31, 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 Supplement[2] 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 Leapfrog Hospital Safety Grade.

BAR CODE MEDICATION ADMINISTRATION (BCMA)

The Leapfrog Hospital Survey is the **primary data source** for BCMA. Hospitals that report their progress in meeting the BCMA Standard on the 2019 Leapfrog Hospital Survey by August 31, 2019 will receive a measure score based on their Leapfrog performance for the BCMA measure.

The 2018 AHA Annual Survey IT Supplement[2] is the **secondary data source** for BCMA. 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 2.1).

Table 2.1 Points Earned for Hospitals That Did Not Submit a 2018 Leapfrog Hospital Survey by August 31, 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 Supplement[2] 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 Leapfrog Hospital Safety Grade.

ICU PHYSICIAN STAFFING (IPS)

The Leapfrog Hospital Survey data is the **primary data source** for IPS. Hospitals that report their progress in meeting the IPS Standard on the 2019 Leapfrog Hospital Survey by August 31, 2019, will receive a measure score based on their Leapfrog performance for the IPS measure.

The 2017 AHA Annual Survey[3] is the **secondary data source** for IPS. A hospital's responses to the 2017 AHA Annual Survey[3] 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 3.1).

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 3.1 Points Earned for IPS for Hospitals That Did Not Submit a 2019 Leapfrog Hospital Survey by August 31, 2019

2017 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	
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.

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 Survey[3] 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 Leapfrog Hospital Safety Grade.

HEALTHCARE-ASSOCIATED INFECTIONS

The Leapfrog Hospital Survey data is the **primary data source** for CLABSI, CAUTI, MRSA, C. Diff., and SSI: Colon. Leapfrog will use standardized infection ratios (SIRs) obtained directly from the CDC's National Healthcare Safety Network (NHSN) application for hospitals that 1) joined Leapfrog's NHSN group, 2) provided an accurate NHSN ID in the Profile section of the Online Survey Tool, and 3) submitted Section 7 Managing Serious Errors Leapfrog by August 31, 2019. If a hospital did not report to Leapfrog for this measure, CMS data will be used as a secondary data source.

Table 4.1 Hospitals That Did Not Submit a 2019 Leapfrog Hospital Survey by August 31, 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.

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)

- 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)

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FALL 2019 STANDARD MEASURE WEIGHTS

Measure	Evidence Score	Opportunity Score	Impact Score	Measure Weight
Process/Structural Measure Domain (50%)				
CPOE	2	1.35	3	5.7%
BCMA	2	1.31	3	5.6%
IPS	2	1.80	3	7.0%
SP 1	1	1.07	2	3.0%
SP 2	1	1.11	2	3.0%
SP 4	1	1.10	2	3.0%
SP 9	1	1.08	3	4.0%
SP 19	2	1.15	2	4.1%
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	4.6%
CLABSI	2	1.81	3	4.6%
CAUTI	2	1.74	3	4.4%
SSI: Colon	2	1.80	2	3.5%
MRSA	2	1.80	3	4.6%
C. Diff.	2	1.53	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 all data elements have been collected for a given hospital, the Leapfrog Hospital Safety Grade can be calculated using the methodology described below.

CALCULATING Z-SCORES

Z-Scores are used to standardize data from individual measures with different scales. This allows for the comparison of individual scores from different types of data. For example, a score of 90 on H-COMP-1: Nurse Communication cannot be compared to a CLABSI SIR of 0.87, as they are reported on different scales. In addition, Z-Scores can indicate to a hospital whether their score on a particular measure is above, below, or equal to the average hospital.

In the Scoring Methodology, a Z-Score is calculated for each measure that is applicable to a hospital. 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: [Hospital Score – Mean) / Standard Deviation]**
- **For Outcome Measures: [(Mean – Hospital Score) / Standard Deviation]**

The following table includes the national mean and standard deviation for each measure. These values are used to calculate your 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)	77.10	27.13
Bar Code Medication Administration (BCMA)	80.28	24.93
ICU Physician Staffing (IPS)	55.61	44.33
Safe Practice 1: Leadership Structures and Systems	117.20	7.91
Safe Practice 2: Culture Measurement, Feedback & Intervention	116.65	12.55
Safe Practice 4: Identification and Mitigation of Risks and Hazards	97.05	9.87
Safe Practice 9: Nursing Workforce	97.91	7.82

Process and Structural Measures	Mean	Standard Deviation
Safe Practice 19: Hand Hygiene	56.97	8.50
H-COMP-1: Nurse Communication	90.90	2.18
H-COMP-2: Doctor Communication	90.89	2.00
H-COMP-3: Staff Responsiveness	84.34	3.48
H-COMP-5: Communication about Medicines	77.94	3.38
H-COMP-6: Discharge Information	86.60	3.08

Outcome Measures	Mean	Standard Deviation
Foreign Object Retained	0.02	0.06
Air Embolism	0.001	0.02
Falls and Trauma	0.44	0.35
CLABSI	0.73	0.59
CAUTI	0.79	0.58
SSI: Colon	0.84	0.67
MRSA	0.84	0.67
C. Diff.	0.69	0.37
PSI 3: Pressure Ulcer Rate	0.49	0.42
PSI 4: Death Rate among Surgical Inpatients with Serious Treatable Conditions	162.89	19.33
PSI 6: Iatrogenic Pneumothorax Rate	0.27	0.06
PSI 11: Postoperative Respiratory Failure Rate	7.65	2.67
PSI 12: Perioperative PE/DVT Rate	3.83	0.99
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 truncates 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 <u>exceeds</u> the 99th percentile) Leapfrog "trims" the reported value to the 99th percentile. For example, if CMS has reported a rate of 0.50 per 1,000 patient discharges for the Foreign Object Retained measure for your hospital, Leapfrog has "trimmed" this rate to 0.36 (e.g. the 99th percentile). Therefore, on the Leapfrog Hospital Safety Grade website, you'll see the measure score for Foreign Object Retained displayed as 0.36. Please see the table below for a list of the "trim" values for the Fall 2019 Leapfrog Hospital Safety Grade.

Measure	99th Percentile
Foreign Object Retained	0.36
Falls and Trauma	1.625
CLABSI	2.952
CAUTI	2.849
SSI: Colon	2.922
MRSA	3.265
C. Diff.	1.953
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	0.47
PSI 11: Postoperative Respiratory Failure Rate	16.32
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

The weight of any measure that is missing for a hospital is redistributed to the other measures in the same measure domain. The new weight for each measure is determined by summing the weights of all available measures in the domain and then dividing each measure weight by the total weight. The result is the new measure weight within that domain. Note that each domain contributes to 50% of the overall letter grade and therefore must be divided in half to find the final 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 your hospital's numerical safety score, multiply the Z-Score of each process measure by the weight assigned for that measure to get the weighted process measure score. (Remember, if your hospital had other process measures that were not available, your hospital's weight on any given process or structural measure may differ from the standard weight). Then, find the total process score by adding the weighted process measure scores of each process measure together. This is your hospital's overall weighted process score.

Then, multiply the Z-Score of each outcome measure by the weight assigned to that measure to get the weighted outcome measure score. (Remember, if your hospital had other outcome measures that were not available, your hospital's weight on any given outcome measure may differ from the standard weight). Then, find the total outcome score by adding the weighted outcome measure scores of each outcome measure together. This is your hospital's overall weighted outcome score.

To calculate the overall Leapfrog Hospital Safety Grade for your hospital, add the weighted process score and the weighted outcome score calculated in the previous step. Add 3.0 to your score; this is done to normalize scores to a positive distribution.

To assist hospitals in calculating their numerical score, a calculator is available on the Safety Grade Review Website.

TERMS USED IN SCORING AND PUBLIC REPORTING

"Not Available" means that the hospital does not have data for this measure. This could be because the measure is related to a service the hospital does not provide. For example, a hospital that does not have an ICU would not be able to report data about ICUs. It could also be because the hospital had too few patients or cases to report data for a particular 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 was targeted to submit a Leapfrog Hospital Survey and did not. Therefore, the hospital is indicated as "Declined to Report" for that measure. For example, if a hospital did not report on its progress in implementing the Safe Practices, it will receive a score of "Declined to Report." Measures scored as "Declined to Report" will not be used in calculating the overall score. As a result, the remainder of a hospital's applicable measures will receive higher weights. This is because the weights from measures that the hospital did not report are allocated across the other measures.

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 measures, Hospital-Acquired Condition measures, Healthcare-Associated Infection measures, and Patient Safety Indicators.

The Leapfrog Hospital Safety Grade relies on publicly reported 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 Survey[3] and/or AHA Annual Survey IT Supplement[2], and track and review their performance on CMS measures used in the Leapfrog Hospital 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 (September 18 – October 8), 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 (June 30), 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 (September 18 – October 8), 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 Survey[3] and/or AHA Annual Survey IT Supplement[2] 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 Survey[3], 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 <u>NOT</u> 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 Supplement[2] 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 (September 18 – October 8), 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 website or the 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 website and the Data.CMS.Gov website. More information is available at https://qualitynet.org.

HOW TO PARTICIPATE IN THE LEAPFROG HOSPITAL SURVEY

If your hospital did **not** complete a 2019 Leapfrog Hospital Survey by August 31, results from the Survey were not used to calculate your Leapfrog Hospital Safety Grade. Leapfrog will update Leapfrog Hospital Safety Grades again in the spring of 2020. If your hospital would like Leapfrog Hospital Survey Results included in the next Leapfrog Hospital Safety Grade, a 2019 Leapfrog Hospital Survey **must be submitted by November 30, 2019**. 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.