

Final Updates to the Fall 2021 Leapfrog Hospital Safety Grade Methodology

On April 29, 2021, Leapfrog published planned updates to the Hospital Safety Grade methodology and held a public comment period through May 31, 2021. We thank commenters for their insightful feedback and suggestions that helped us refine the methodology. This document summarizes the final changes that will be made to the scoring methodology effective with the fall 2021 Hospital Safety Grade.

In addition, this document includes other important information about the fall 2021 Hospital Safety Grade including:

- [Appendix A: Fall 2021 Leapfrog Safety Grade Measures, Reporting Periods, and Data Sources](#)
- [Appendix B: Responses to Public Comments](#)

Leapfrog is planning five changes to the methodology that will be used to calculate the fall 2021 Hospital Safety Grades. Please review these updates carefully, as Leapfrog has made significant changes since April 29 based on the public comments that Leapfrog received.

The final methodology updates outlined in this document include:

1. [Scoring for the Hand Hygiene measure from the Leapfrog Hospital Survey](#)
2. [Reporting period for the healthcare associated infection \(HAI\) measures](#)
3. [Replacing six \(6\) of the individual PSI measures with the PSI 90 composite measure](#)
4. [Implementing a new standard weight calculation to account for the addition of a composite measure \(PSI 90\)](#)
5. [Updating the missing data threshold for outcomes measures](#)

Important dates for the fall 2021 Hospital Safety Grade are available on the Hospital Safety Grade [website](#).





1. Scoring for the Hand Hygiene measure from the Leapfrog Hospital Survey

Background

Due to COVID-19, Leapfrog only scored and publicly reported [Survey Results](#) for the new Hand Hygiene measure for hospitals that performed in the top two performance categories (i.e., Achieved the Standard or Considerable Achievement) on the 2020 Leapfrog Hospital Survey. In the fall 2020 and spring 2021 Hospital Safety Grades, performance on both performance categories was scored as 60 points (the maximum possible score). For the 2021 Leapfrog Hospital Survey, Leapfrog will score and publicly report all four performance categories (i.e., Achieved the Standard, Considerable Achievement, Some Achievement, and Limited Achievement) for the Hand Hygiene measure.

Update to the fall 2021 Hospital Safety Grade Methodology

Beginning with the fall 2021 Hospital Safety Grade, the following points will be assigned to each of the four performance categories from the Leapfrog Hospital Survey for the Hand Hygiene measure:

2021 Leapfrog Hospital Survey Performance Category for the Hand Hygiene Measure	Fall 2021 Safety Grade Score for the Hand Hygiene Measure
Achieved the Standard 	100
Considerable Achievement 	70
Some Achievement 	40
Limited Achievement 	15

Based on historical performance on the Leapfrog Hospital Survey Hand Hygiene measure, Leapfrog anticipates that hospitals scoring in the top two performance categories (i.e., assigned 100 or 70 points) will likely be above the mean used to calculate z-scores this fall. Scores above the mean receive a positive z-score, which is then multiplied by the standard measure weight (to be determined after the August 31 Data Snapshot Date).

Hospitals that do not submit a 2021 Leapfrog Hospital Survey by the [August 31 Data Snapshot Date](#) will be scored and publicly reported as “Declined to Respond” for the Hand Hygiene Measure on Leapfrog’s Survey Results [website](#). For the purposes of calculating the fall 2021 Hospital Safety Grade, the standard weight assigned to the Hand Hygiene measure in the Hospital Safety Grade methodology will be redistributed to the other measures in the Process/Structural Measure Domain. More information about dealing with missing data is available in the [Hospital Safety Grade Scoring Methodology](#).

2. Reporting period for healthcare-associated infection (HAI) measures

Background

The Leapfrog Hospital Survey is the primary data source for the five HAI measures (CLABSI, CAUTI, MRSA, C. diff., and SSI: Colon) included in the Hospital Safety Grade. For the purposes of the Survey, Leapfrog obtains HAI data directly from NHSN for hospitals that provide a valid NHSN in the Profile Section of the Online Survey Tool, join Leapfrog’s NHSN Group, and

submit Section 7 of the Leapfrog Hospital Survey by the [published deadlines](#). For hospitals that do not complete these steps by the [August 31 Data Snapshot Date](#), HAI data published by CMS are used to calculate the Hospital Safety Grade.

Update to the fall 2021 Hospital Safety Grade Methodology

Leapfrog originally planned to maintain CMS’ HAI data that was used in the spring 2021 Safety Grade for those hospitals that do not have infection data available via the 2021 Leapfrog Hospital Survey on the [August 31 Data Snapshot Date](#). Based on public comments received, and to help ensure alignment between those hospitals that report to the Leapfrog Hospital Survey and those relying on CMS HAI data in calculating the Hospital Safety Grade, Leapfrog will [update the reporting period](#) for the five HAI measures on the 2021 Leapfrog Hospital Survey to match the reporting period for the five HAI measures that will be published by CMS in July 2021. Therefore, the reporting period for the HAI measures for all data sources (2021 Leapfrog Hospital Survey and CMS) in the fall 2021 Safety Grade will be **2019Q2-2019Q4 AND 2020Q3**.

In addition, Leapfrog will provide a footnote on the Survey Results [website](#) and the Leapfrog Hospital Safety Grade [website](#) for each of the five HAI measure scores to indicate that one quarter of data included in the reporting period was collected during the COVID-19 pandemic.

3. Replacing six (6) of the individual PSI measures with the PSI 90 composite measure

Background

Leapfrog has previously included seven individual Patient Safety Indicators (PSIs) in the Hospital Safety Grade. In recent years, PSI 90, a composite made up of 10 other PSIs, referred to as “component” PSIs, has been tested and updated significantly and is now a central component of CMS’ Hospital-Acquired Condition Reduction Program (HACRP).

Update to the fall 2021 Hospital Safety Grade Methodology

To align with CMS’ efforts to reduce harm to patients from medical and surgical complications, Leapfrog will replace six of the seven individual PSIs in the Leapfrog Hospital Safety Grade with the PSI 90 composite measure. Thus, as illustrated in Table 1, starting this fall, the Hospital Safety Grade will include two PSIs: PSI 4: Death Rate among Surgical Inpatients with Serious Treatable Conditions and PSI 90: Patient Safety and Adverse Events Composite. The inclusion of PSI 90 will allow Leapfrog to account for postoperative sepsis rate and other important patient safety measures.

For the purposes of public reporting on the Hospital Safety Grade [website](#), Leapfrog will display performance on each of the 10 component PSIs included in PSI 90.

Table 1: PSI Measures included in the Hospital Safety Grade in Spring 2021 vs Fall 2021

PSI	Indicator	PSI 90 Component Measure	Spring 2021 Hospital Safety Grade measure	Fall 2021 Hospital Safety Grade measure
PSI 4	Death Rate among Surgical Inpatients with Serious Treatable Conditions	No	Yes	Yes
PSI 90	Patient Safety and Adverse Events Composite	N/A	No	Yes
PSI 3	Pressure ulcer rate	Yes	Yes	No
PSI 6	Iatrogenic pneumothorax rate	Yes	Yes	No
PSI 8	In-hospital fall with hip fracture rate	Yes	No	No
PSI 9	Perioperative hemorrhage and hematoma rate	Yes	No	No
PSI 10	Postoperative acute kidney injury rate	Yes	No	No
PSI 11	Postoperative respiratory failure rate	Yes	Yes	No
PSI 12	Perioperative pulmonary embolism or deep vein thrombosis rate	Yes	Yes	No
PSI 13	Postoperative sepsis rate	Yes	No	No
PSI 14	Postoperative wound dehiscence rate	Yes	Yes	No

PSI 15	Unrecognized abdominopelvic accidental puncture/laceration rate	Yes	Yes	No
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Additional information about the PSI 90 measure and how it is calculated by CMS can be found [here](#)

Please note that because the PSI 90 measure score represents an observed to expected ratio that has already been risk-adjusted at both the component PSI level and at the composite level, Leapfrog will not be trimming the PSI 90 measure scores for hospitals that have a score at or above the 99th percentile as it does for other outcome measures.

4. Implementing a new standard weight calculation to account for the addition of a composite measure (PSI 90)

To ensure that PSI 90, which includes 10 component PSI measures, is assigned an appropriate standard weight, Leapfrog will update its standard weight calculation to include a fourth element specifically designed to account for composite measures.

Starting with the fall 2021 Safety Grade, the number of component measures in a composite measure (i.e., 10 individual measures for PSI 90) will be included in the weight score calculation. Leapfrog initially planned to multiply the entire measure weight score by the number of component measures but based on compelling public comments, Leapfrog has modified the weight score calculation by moving the number of component measures inside of the inner parenthesis in the formula below, so that the measure’s evidence is no longer multiplied by the number of component measures. This will reduce the **estimated** standard weight for PSI 90 from 18.8% to 15.3%.

$$\text{Measure Weight Score: } ((\text{Evidence} + (\text{Impact} \times \text{Opportunity} \times \text{Number of Child Measures}))$$

Based on the current measure weight criteria, PSI 90 will receive an Evidence score of 1 and Impact score of 2. The Opportunity score will be calculated this fall based on the number of hospitals that receive a fall 2021 Safety Grade and thus cannot be determined in advance. Table 2 illustrates how the inclusion of PSI 90 is **estimated** to affect the individual measure weights of each measure included in the Outcome Measures Domain this fall. As a reminder, if a hospital is missing a score for one or more measures, then those measure weights will be redistributed to the remaining measures in the domain.

Table 2: Estimated Standard Measure Weights in the Outcome Measures Domain of the Hospital Safety Grade in Spring 2021 vs Fall 2021

Outcome Measure	Spring 2021 Standard Measure Weight	Estimated Fall 2021 Standard Measure Weight due to the inclusion of PSI 90
Foreign Object Retained	4.3%	4.3%
Air Embolism	2.5%	2.5%
Falls and Trauma	4.6%	4.7%
CLABSI	4.6%	4.6%
CAUTI	4.4%	4.5%
SSI: Colon	3.5%	3.5%
MRSA	4.5%	4.5%
C. Diff.	4.2%	4.2%
PSI-3	4.0%	N/A
PSI-4	2.0%	2.0%
PSI-6	2.1%	N/A
PSI-11	2.2%	N/A
PSI-12	2.2%	N/A

PSI-14	2.0%	N/A
PSI-15	2.9%	N/A
PSI-90	N/A	15.3%
Total Weight of Outcome Measures (half of Safety Grade Weight)	50%	50%

5. Updating the missing data threshold for outcomes measures

Background

In previous rounds of the Hospital Safety Grade, hospitals missing more than six (6) process/structural measures or more than five (5) outcome measures were not graded.

Update

Starting with the fall 2021 Hospital Safety Grade, hospitals missing more than six (6) process/structural measures, or more than **three (3)** outcome measures, or **missing PSI 90** will not be graded.

Appendix A: Fall 2021 Leapfrog Safety Grade Measures, Reporting Periods, and Data Sources

PROCESS AND STRUCTURAL MEASURES (12)				
Measure Name	Primary Data Source	Reporting Period	Secondary Data Source	Reporting Period
Computerized Physician Order Entry (CPOE)	2021 Leapfrog Hospital Survey	2021	Imputation Model Applied	N/A
Bar Code Medication Administration (BCMA)	2021 Leapfrog Hospital Survey	2021	Imputation Model Applied	N/A
ICU Physician Staffing (IPS)	2021 Leapfrog Hospital Survey	2021	Imputation Model Applied	N/A
Safe Practice 1: Leadership Structures and Systems	2021 Leapfrog Hospital Survey	2021	N/A	N/A
Safe Practice 2: Culture Measurement, Feedback & Intervention	2021 Leapfrog Hospital Survey	2021	N/A	N/A
Safe Practice 9: Nursing Workforce	2021 Leapfrog Hospital Survey	2021	N/A	N/A
Hand Hygiene	2021 Leapfrog Hospital Survey	2021	N/A	N/A
H-COMP-1: Nurse Communication	CMS	01/01/2019 – 12/31/2019	N/A	N/A
H-COMP-2: Doctor Communication	CMS	01/01/2019 – 12/31/2019	N/A	N/A
H-COMP-3: Staff Responsiveness	CMS	01/01/2019 – 12/31/2019	N/A	N/A
H-COMP-5: Communication about Medicines	CMS	01/01/2019 – 12/31/2019	N/A	N/A
H-COMP-6: Discharge Information	CMS	01/01/2019 – 12/31/2019	N/A	N/A

OUTCOME MEASURES (10)				
Measure Name	Primary Data Source	Reporting Period	Secondary Data Source	Reporting Period
Foreign Object Retained	CMS	07/01/2018 – 12/31/2019	N/A	N/A
Air Embolism	CMS	07/01/2018 – 12/31/2019	N/A	N/A
Falls and Trauma	CMS	07/01/2018 – 12/31/2019	N/A	N/A
CLABSI	2021 Leapfrog Hospital Survey	04/01/2019 – 12/31/2019 AND 07/01/2020 – 9/30/2020	CMS	04/01/2019 – 12/31/2019 AND 07/01/2020 – 9/30/2020
CAUTI	2021 Leapfrog Hospital Survey	04/01/2019 – 12/31/2019 AND 07/01/2020 – 9/30/2020	CMS	04/01/2019 – 12/31/2019 AND 07/01/2020 – 9/30/2020
SSI: Colon	2021 Leapfrog Hospital Survey	04/01/2019 – 12/31/2019 AND 07/01/2020 – 9/30/2020	CMS	04/01/2019 – 12/31/2019 AND 07/01/2020 – 9/30/2020
MRSA	2021 Leapfrog Hospital Survey	04/01/2019 – 12/31/2019 AND 07/01/2020 – 9/30/2020	CMS	04/01/2019 – 12/31/2019 AND 07/01/2020 – 9/30/2020
C. Diff.	2021 Leapfrog Hospital Survey	04/01/2019 – 12/31/2019 AND 07/01/2020 – 9/30/2020	CMS	04/01/2019 – 12/31/2019 AND 07/01/2020 – 9/30/2020
PSI 4: Death Rate among Surgical Inpatients with Serious Treatable Conditions	CMS	07/01/2018 – 12/31/2019	N/A	N/A
PSI 90: Patient Safety and Adverse Events Composite	CMS	07/01/2018 – 12/31/2019	N/A	N/A

Appendix B: Responses to Public Comments

Below are responses to public comments received in response to the Planned Updates to the Fall 2021 Hospital Safety Grade first published on April 29, 2021.

Scoring for the Hand Hygiene measure from the Leapfrog Hospital Survey

Several commenters shared concerns about differentiating performance on the Leapfrog Hospital Survey Hand Hygiene by assigning varying points for each of the four performance categories in the Hospital Safety Grade Methodology (i.e., Achieved the Standard is assigned 100 points, Considerable Achievement is assigned 70 points, etc.).

During COVID, Leapfrog chose to minimize the impact of a new survey standard by only public reporting the two top performance categories. This was communicated as a one-time only change. Leapfrog always intended to reflect differences in performance on the Hand Hygiene standard, similar to how it reflects differences in performance for all measures on the Leapfrog Hospital Survey. The points assigned to each category reflect the relative difficulty of achieving that category and its impact on patient safety.

Some commenters expressed concern that Hand Hygiene has too much weight given the difficulty with achieving the highest score for that measure.

The Hand Hygiene measure includes five domains monitoring, feedback, training and education, infrastructure, and culture. Hospitals can earn full or partial credit based on their adoption of the practices included in each of the five domains. More information is available in the [Leapfrog Hospital Survey Scoring Algorithms](#). The Hand Hygiene measure has an overall standard weight of approximately 4% in a hospital's score on the Hospital Safety Grade. Given the importance of hand hygiene and the accumulated evidence over decades, this weight is appropriate. In addition, as described above, based on historical performance on the Leapfrog Hospital Survey Hand Hygiene measure, Leapfrog anticipates that hospitals scoring in the top two performance categories will likely receive a score that will be above the mean used to calculate z-scores for the measure this fall. Scores above the mean receive a positive z-score on the measure, which is then multiplied by the standard measure weight.

Maintaining CMS infection data from the spring 2021 Hospital Safety Grade for hospitals that do NOT submit a 2021 Leapfrog Hospital Survey (including Section 7)

Some commenters shared concerns about the Leapfrog Hospital Survey HAI reporting period including two quarters of 2020 data while the CMS HAI reporting period would not include any quarters of 2020 data.

Leapfrog will update the reporting period for the five HAI measures on the 2021 Leapfrog Hospital Survey to match the reporting period for the five HAI measures that will be published by CMS in July 2021. Therefore, the reporting period for the HAI measures for all data sources (2021 Leapfrog Hospital Survey and CMS) in the fall 2021 Safety Grade will be 2019Q2-2019Q4 AND 2020Q3.

One commenter requested that Leapfrog use NHSN data for hospitals that are in our NHSN group, but do not submit a 2021 Leapfrog Hospital Survey by the published deadlines, as the commenter wanted more current HAI data included in the Hospital Safety Grade but did not want to submit a Leapfrog Hospital Survey.

Leapfrog does not score or publicly report data obtained from NHSN for any of the five HAI measures for hospitals that do not submit Section 7 of the Leapfrog Hospital Survey, regardless of whether or not the hospital has joined our NHSN Group, as hospitals are required to complete the [Affirmation of Accuracy](#) for each section of the Survey in order for the information to be scored and publicly reported.

Replacing six (6) of the individual PSI measures with the PSI 90 composite measure

Some commenters suggested that because CMS is proposing to remove PSI 90 from the CMS Value Based Purchasing Program, Leapfrog should not add the measure to the Hospital Safety Grade.

The PSI 90 measure remains one of six measures included in the CMS Hospital-Acquired Condition Reduction Program (HACRP) and based on the FY2022 IPPS Proposed Rule, the measure will continue to be included in HACRP and publicly reported on the CMS Care Compare [website](#).

One commenter expressed concern that it will be difficult to compare previous Hospital Safety Grade rounds to newer rounds since the inclusion of PSI 90 is a significant change.

Based on preliminary analysis of this update, Leapfrog does not anticipate major grade changes for most hospitals as PSI 90 includes all the PSIs Leapfrog is removing from the Hospital Safety Grade methodology. Additionally, Leapfrog is committed to ensuring the Hospital Safety Grade composite always reflects the best available measures focused on patient safety.

One commenter expressed concern that since PSI 8 Postoperative Hip Fracture is included in PSI 90, and shares ICD-10 codes with the DRA HAC Falls and Trauma measure, there is risk of double counting.

Based on an analysis of our technical experts, overlap between these two measures is minimal. PSI-08 focuses on a narrow subset of Medicare Fee-for-Service patients (post-operative patients) and a specific type of injury (hip fracture). The DRA HAC measure includes all Medicare Fee-for-Service patients and many different types of falls with injury.

Some commenters shared their concerns about PSI 90 being more complicated and less actionable than the individual PSIs, noting that PSI 90 can be difficult or impossible to calculate using their own internal software.

CMS has introduced changes in recent years which make the PSI 90 methodology more intuitive. For instance, the latest versions of PSI 90 more equally distribute the component weights than the original version. Additionally, harm to the patient is now incorporated into component weight, so that volume is no longer the only factor. These two changes have made PSI 90 and its component weighting easier to comprehend (see pages 16-17 [here](#)). While Leapfrog will no longer include the individual component measures into our Safety Grade calculation, we will publicly report all of PSI 90's component measures so that hospitals and the public can see all of the measures that PSI 90 includes and set improvement goals accordingly. Additionally, the CMS Patient Safety Indicators (PSI) Hospital-Specific Reports provide information to hospitals on the weights and results for each component measure of PSI 90 (see the July 2020 "CMS PSI Mock HSR" and "Hospital-Specific Report User Guide (HUG) for Outcome, Payment, and CMS PSI Measures" [here](#)). Lastly, the primary purpose of the Leapfrog Hospital Safety Grade is to allow consumers to reliably assess the safety of their local hospital and choose the safest hospital to seek care, and the strongest evidence supports PSI 90 to advance that purpose.

One commenter expressed concern that PSI 90 is not intended to be used for hospital-to-hospital comparison.

PSI 90 has been in use in two of CMS' value payment programs: HAC Reduction Program and Hospital Value-Based Purchasing Program, and results from the measure have been and continue to be publicly reported on the CMS Care Compare [website](#) for the purpose of hospital to hospital comparisons. Our assessment of the evidence aligns with this use of the measure.

Implementing a new standard weight calculation to account for the addition of a composite measure (PSI 90)

Some commenters shared concerns about Leapfrog assigning too much weight to PSI 90 measure.

As a result of comments on the originally planned updates to the methodology, Leapfrog has adjusted the measure weight score formula to calculate the standard weight for PSI 90. The new standard weight, estimated as 15.3%, is very similar to the summed weight of the six individual PSIs previously included in the methodology (15.5%).

Other Comments Received

Some commenters shared concerns about CMS’s proposed plan to remove PSI 4 from the Inpatient Quality Reporting Program beginning in FY2022 and questioned whether Leapfrog would remove PSI 4 from the Hospital Safety Grade in anticipation of this.

Leapfrog strongly opposes the CMS proposed rule to remove PSI-4 from the Inpatient Quality Reporting Program. PSI 4 is a powerful and important patient safety measure and one of the highest priority measures for purchasers and consumers. Leapfrog has formed a coalition urging CMS not to finalize this part of the proposed rule. Leapfrog has no plans currently to remove PSI 4 from the Hospital Safety Grade methodology.

One commenter expressed concern that PSI 4 disadvantages trauma receiving centers and safety net hospitals.

Leapfrog will continue to closely monitor measurement concerns like this as they are raised in the literature.

One commenter disapproved of Step 2 imputation which assigns the average measure score of “like” hospitals for CPOE and BMCA, noting that hospitals that do not submit a Leapfrog Hospital Survey should receive no credit on the measures.

As previously described, Leapfrog will continue to explore alternative data sources for these measures and alternative imputation methods that ensure fairness and comparability. The Leapfrog Hospital Survey sets the highest standards for achievement, which is why hospitals that achieve Leapfrog’s standards on the Survey are assigned the maximum number of points for particular measures (i.e., CPOE, BCMA, etc.).

One commenter thought hospitals that complete the Leapfrog Hospital Survey have too much of an advantage when calculating the Hospital Safety Grade.

Because consumers use Hospital Safety Grades to inform life and death decisions on where to receive care, Leapfrog is committed to using the best publicly available information to calculate Hospital Safety Grades. This includes information from the Leapfrog Hospital Survey, an evidence-based patient safety and quality Survey that provides the best data and sets the highest standards for important measures such as medication safety, hand hygiene, and others. Achievement of Leapfrog’s robust standards can earn hospitals more points for those measures. Nevertheless, a hospital that does not complete a Survey, but that excels at safety compared to their peers nationally will earn a grade that reflects that excellence.

Some commenters expressed concerns about COVID-19 impacting the PSI and patient experience (HCAHPS) measures.

As outlined in Appendix A, the reporting periods for the CMS measures, including PSI 4, PSI 90, and the HCAHPS measures do not include any quarters from 2020.

One commenter asked Leapfrog to explore alternative data source for Safe Practice measures to reduce duplication for hospitals that report this information elsewhere.

Leapfrog is not aware of any alternative data sources that capture the important patient safety information that the existing Safe Practices capture. To the extent hospitals are reporting this same information elsewhere, that data is not made publicly available by hospital and thus not usable for the Hospital Safety Grade. If you are aware of alternative publicly available data sources, we would welcome specific suggestions. We also encourage hospitals to advocate that data collection enterprises make the data publicly available, which would have many advantages including alleviating the duplication of effort problem the commenter describes.