

# About Saturation Scoring

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Saturation scoring allow hospitals to calculate the degree of saturation or overcrowding in their Emergency Departments (EDs) so that the facility can accurately communicate its availability.

The saturation scoring tool employs several key inputs related to the ED, including capacity, volume, and acuity of patients in the ED. EMResource offers a second saturation scoring tool, the National Emergency Department Overcrowding Score (NEDOCS). NEDOCS takes into account ED capacity and the acuity of current patients. However, NEDOCS also uses ED throughput to inpatient beds as a key component to the calculation. Both options are available in the list of available [Status Types](#).

## NEDOCS

NEDOCS "is the global standard for measuring patient throughput" ([NEDOCS](#)), helping hospitals measure capacity and reduce overcrowding. This saturation score takes a variety of factors into account, including the number of ED patients, beds, and admissions, as well as ED throughput.

## Form and View Pages

When you update a NEDOCS status, the system asks you to enter numbers in seven fields. To get an accurate calculation, you must enter a number in each field. After you add a number to the last field, click **Calculate** to get the score.

**NEDOCS: NEDOCS**

<input type="text"/>	Number of ED Patients	<input type="text" value="10"/>	Number of ED Beds
<input type="text"/>	Number of ED Admits	<input type="text"/>	Number of Inpatient Beds (excluding PEDS and OB)
<input type="text"/>	Last Door-to-bed Time (hours, ex: 1.25)	<input type="button" value="Calculate"/>	
<input type="text"/>	Number of Critical Care Patients (in ED)		
<input type="text"/>	Longest ED Admit (hours, ex: 1.25)		

-- NEDOCS (Calculated) [NEDOCS Help Document](#)

When you enter certain values for a hospital, such as the **Number of ED Beds**, the solution retains that information and makes it available the next time you update this status. You can change this value as needed.

**Note:** The solution assumes that the questions are being answered based on current conditions and will automatically note the date and time the information is being provided.

After it has been computed and saved, the calculated score can appear in View and details pages. If the **Reset value upon expiration?** option is selected, the system displays expired saturation scores as dashes.

ED	Status	Comment	Last Update
NEDOCS	144 - Severe		20 May 16:09
Saturation Score	87		20 May 16:11

You have a number of options when configuring a saturation score status type. Notice that the scores in the example above are [color coded](#).

## Scale

The following table shows the scale for NEDOCS. By default, these ranges have already been color coded to aid your users in quickly detecting the current level of overcrowding. The calculated score appears on the appropriate View and details pages in the color specified for that score. The score also shows a brief description, such as **144 - Severe**. Your organization may have opted to remove these descriptive labels. In these cases, the score appears and is color coded, but there is no associated descriptive label.

Scale	Definition	Default Color in EMResource	Default Label
0-20	ED is not busy	Green	Normal
21-60	ED is busy	Blue	<ul style="list-style-type: none"> <li>• Normal: 21-50</li> <li>• 51-60 (Busy)</li> </ul>
61-100	ED is extremely busy but not overcrowded	Yellow	Busy
101-140	ED is overcrowded	Purple	Overcrowded
141-180	ED is severely overcrowded	Red	Severe
181 and higher	ED is dangerously overcrowded	Black	Disaster

## Fields and Calculation

Your existing data appears in the two fields on the right. EMResource uses this, plus data in the following fields, to calculate your NEDOCS. You need to determine the following values to enter on the NEDOCS form.

### Calculation

$$\text{NEDOCS} = 85.8(C/A) + 600(F/B) + 13.4(D) + 0.93(E) + 5.64(G) - 20$$

	Field in Form	Description
A	Number of ED Beds	Total number of ED beds available or staffed, including hallways and chairs
B	Number of Inpatient Beds	Total number of inpatient beds (excluding PEDS and OB)
C	Number of ED Patients	Total number of ED patients, including hallways, chairs, admissions, and waiting room
D	Number of Critical Care Patients (in ED)	Total number of critical care patients in the ED (1:1 ratio, ventilators, psych, or ICU patients)
E	Longest ED Admit (in hours)	Longest admission time waiting in the ED; 15 minute increments; example: enter 2.25 for 2 1/4 hours
F	Number of ED Admits	Total number of ED admissions waiting in the ED (that is, waiting for an inpatient bed)
G	Last Door-to-bed Time (in hours)	Door-to-bed time for the last ED patient to get an ED bed; 15 minute increments; example: enter 2.25 for 2 1/4 hours

When all of the appropriate elements have been entered, click **Calculate** to get your NEDOCS saturation score:

**NEDOCS: NEDOCS**

5 Number of ED Patients	10 Number of ED Beds
1 Number of ED Admits	45 Number of Inpatient Beds (excluding PEDS and OB)
2 Last Door-to-bed Time (hours, ex: 1.25)	<input type="button" value="Calculate"/>
1 Number of Critical Care Patients (in ED)	
2.25 Longest ED Admit (hours, ex: 1.25)	

63-Busy : NEDOCS (Calculated) [NEDOCS Help Document](#)

You can continue to change values in the form and recalculate the score. Click **Save** to retain the currently entered values.

**Note:** If the calculation results in a negative number, the score is considered to fall in the Normal / ED is not busy range and is labeled as such.

## More About NEDOCS

NEDOCS was developed by Weiss, et al. and published in the Academy of Emergency Medicine in January 2004. "Results of a five-question reduced model are valid and accurate in predicting the degree of overcrowding in academic centers." [Weiss, SJ, et al., Acad of Emerg Med, 2004 Jan; 11 (1): 38-50]

"The authors hypothesize that a previously developed site-sampling form for academic ED overcrowding is a valid model to quantify overcrowding in academic institutions and can be used to develop a validated short form that correlates with overcrowding." [Weiss, SJ, et al., Acad of Emerg Med, 2004 Jan; 11 (1): 38-50]

## Basic Saturation Score

The saturation score is a standard score that measures the percentage of total capacity for an emergency department (ED). It takes a variety of factors into account, including the size of the ED. Therefore, EDs of various sizes can use this same form and the saturation percentage is adjusted appropriately.

## Form and View Pages

When a user updates the saturation score, the solution asks the user to enter responses to eight queries. To get an accurate calculation, you must enter a number in each field. Click **Calculate** to get the score.

**Saturation Score Status (Required/Overdue):** Saturation score

<input type="text"/>	Number of ED beds occupied	<input type="text"/>	Number of ED beds assigned
<input type="text"/>	Number of patients in lobby	<input type="text"/>	Reasonable lobby capacity
<input type="text"/>	Number of ambulance patients en route or waiting		
<input type="text"/>	Number of general admits		
<input type="text"/>	Number of ICU admits		
<input type="text"/>	Number of patients requiring 1:1 care		
<input type="text"/>	Number of RNs short-staffed		

Lobby wait time exceeds 4 hours

-- Saturation Score (Calculated) [Saturation Score Help Document](#)

Once you or another user initializes (enters values in) the two fields on the right (**Number of ED beds assigned** and **Reasonable lobby capacity**) for a hospital, the system retains that information. You can opt to change these two capacity elements, as necessary and appropriate.

**Note:** The system assumes that the user is entering data based on current conditions and will automatically note the date and time the information is being provided.

Once computed and saved, the calculated score can appear in View pages. If the Reset Value (Reset value upon expiration?) option is selected for the status type, the system displays expired saturation scores as dashes.

Region Default			
	Hernando Hospitals	Saturation Score	Cardiac INTVL
	Regional Hospital	42	Open
	spital	74	Open
	Regional Hosp	--	-

You have a number of options when configuring a saturation score status type. Notice that the scores in the example above are **color coded**.

## Scale

If an emergency department has a saturation score of:

- 0% saturation score — ED is unoccupied
- 50% saturation score — ED is running at about half of its total capacity
- 100% saturation score — ED is running at capacity
- >100% saturation score — ED is running above capacity

## Fields and Calculation

The system supplies your existing data for the two fields on the right side of the page. You can change these two capacity elements as necessary and appropriate.

	Existing Information	Description
1	Number of ED beds assigned	Number of beds in department that are regularly staffed; do not include overflow hall beds unless they are regularly staffed
2	Reasonable lobby capacity	Number of patients your lobby can hold under normal conditions; usually about 50% of assigned beds
	The system uses the sum of 1 and 2 above as the denominator for the total saturation score calculation.	

EMResource uses the data in 1 and 2 above in conjunction with the data you enter in the following fields to calculate your Saturation Score. You need to determine the following values for entry into the saturation score form.

## Calculation

$$\text{Saturation Score} = (A + B + C + D1 + (D2 * 2) + (D3 * 3) + (+2 \text{ if } E = \text{yes}) + F) / (1 + 2)$$

	Field in Form	Description
A	Number of ED beds occupied	Actual number of beds occupied in the ED at the current time
B	Number of patients in lobby	Number of patients (not including visitors) who are currently waiting in the lobby
C	Number of ambulance patients en route or waiting	Include patients who are on the way to this hospital or have already arrived via EMS and are waiting to be turned over to facility staff; do not include patients already counted as being in the lobby
D1	Number of general admits	Number of patients waiting in the ED to be admitted; do not include ICU patients or patients requiring one-on-one care
D2	Number of ICU admits	Number of patients waiting in the ED for intensive care bed admission
D3	Number of patients requiring 1:1 care	Number of patients requiring dedicated one-on-one nursing care; do not include patients included in ICU patient count
F	Number of RNs short-staffed	Number of nurses the ED is down from normal staffing level
		<p>System uses the number of nurses you are short-staffed in the calculation as follows:</p> <ul style="list-style-type: none"> <li>• 1 - 15 beds, add 5 points for every nurse your department is short</li> <li>• 16 - 30 beds, add 5 points for every two nurses</li> <li>• 31 - 45 beds, add 5 points for every three nurses</li> <li>• &gt; 46 beds, add 5 points for every four nurses</li> </ul> <p>When the number of assigned ED beds is greater than 15, you cannot add the next 5 points until you reach the next full amount of nurses you are short-staffed.</p>
E	Lobby wait time exceeds 4 hours	Patient experiences a lobby wait time of greater than 4 hours

When all of the appropriate elements have been entered, click **Calculate** to get your score:

**Saturation Score Status (Required/Overdue):** Saturation score

<input type="text" value="2"/> Number of ED beds occupied	<input type="text" value="10"/> Number of ED beds assigned
<input type="text" value="5"/> Number of patients in lobby	<input type="text" value="25"/> Reasonable lobby capacity
<input type="text" value="0"/> Number of ambulance patients en route or waiting	
<input type="text" value="2"/> Number of general admits	
<input type="text" value="1"/> Number of ICU admits	
<input type="text" value="1"/> Number of patients requiring 1:1 care	
<input type="text" value="0"/> Number of RNs short-staffed	

Lobby wait time exceeds 4 hours

40% Saturation Score (Calculated) [Saturation Score Help Document](#)

You can continue to change values in the form and recalculate the score. Click **Save** to retain the currently entered values.