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CPR scoring explained

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When using your QCPR enabled device from Laerdal, CPR performance is scored from 0% to 100%. If you do CPR exactly according to the Resuscitation Guidelines selected (AHA, ERC, NLS or your custom set guidelines), you will always get a 100% Overall score.

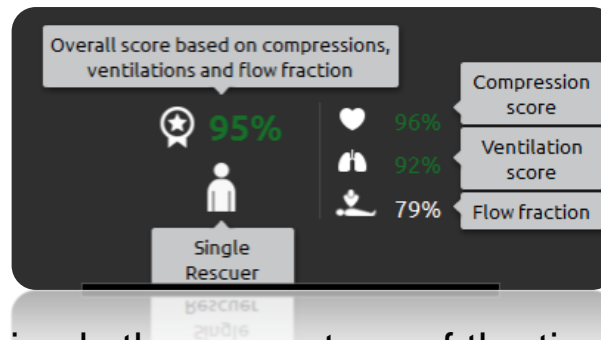
If the CPR performance deviates from the guidelines, the score is reduced. The larger the deviation, the more the score is reduced.

You also get sub scores for each skill: Compressions, Ventilations and with Flow Fraction (or Chest Compression Fraction). This way you can easily keep track of what you have to do to improve your overall CPR performance.

The following slides explain which components that contribute to the score and also how these components are calculated.

The sub scores included in the overall score are:

1. Compression score
2. Ventilation score
3. Flow Fraction score



The Flow Fraction is simply the percentage of the time where compressions were given.

The Ventilation score is weighted as follows in the Overall score:

- Adult: 25 %
- Infant: 35 %
- Newborn: 50 %

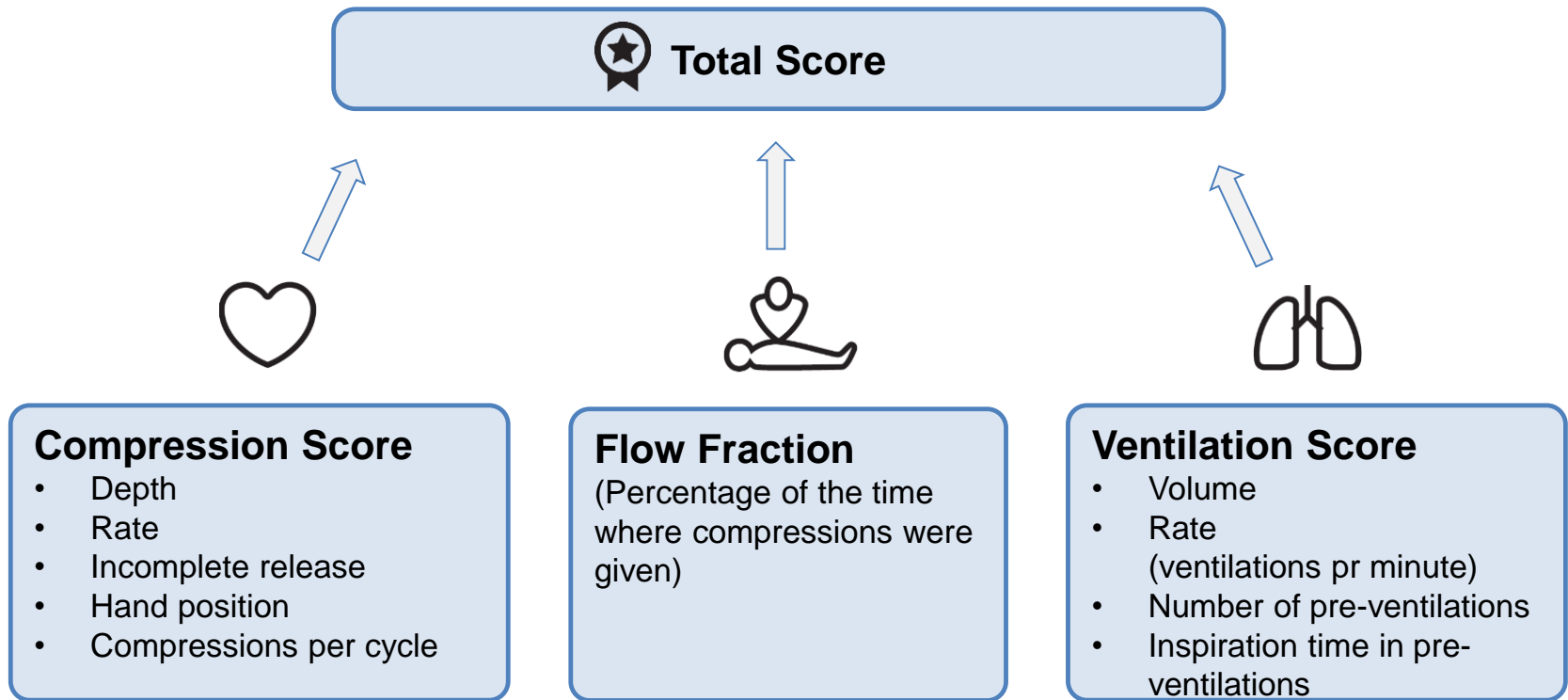
The Compression score and the Ventilation score take several parameters into account:

The Compression score may include score based on following parameters:

- Compression depth
- Compression rate
- Incomplete release
- Number of compressions per cycle
- Hand position

The Ventilation score may include score base on the following parameters:

- Ventilation volume
- Ventilation rate
- Number of pre-ventilations
- Inspiration time in pre-ventilations

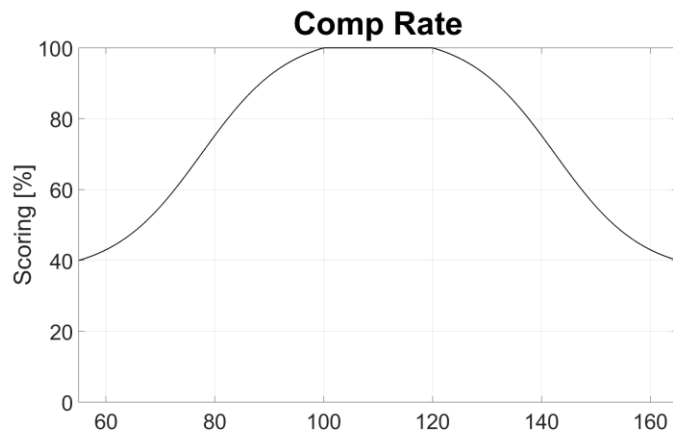


When CPR performance deviates from the guidelines, the scores are reduced along S-curves outside of the thresholds. That means that small deviations create small score reductions, and larger deviations will generate substantial score reductions.

In the following examples you will see how scores are reduced based on some common CPR errors. The curves in example 1 and 2 illustrate what the overall score would be for one particular error *if all other parameters were perfect.*

Example 1: Compression rate on adult patient in a CPR case

This curve shows the score for compression rate. Between 100 and 120 compressions pr minute, the score is 100%. The score drops when the rate moves outside this guideline interval, as shown. The curve shows what the overall score would be for different rates if all other CPR parameters were guidelines compliant.

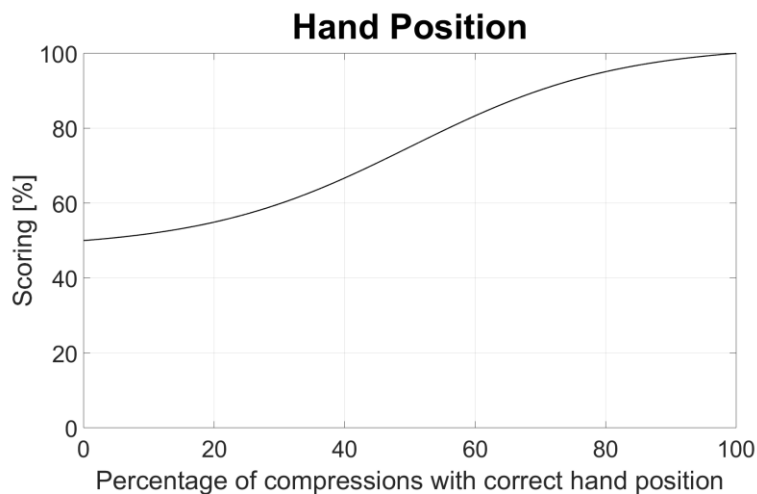


So, as pass/fail level on the overall score is set to 75%, compression rates from 80 to 140 will give a pass. (Given that everything else is perfect).

Compression rate alone cannot pull the overall score below 40%.

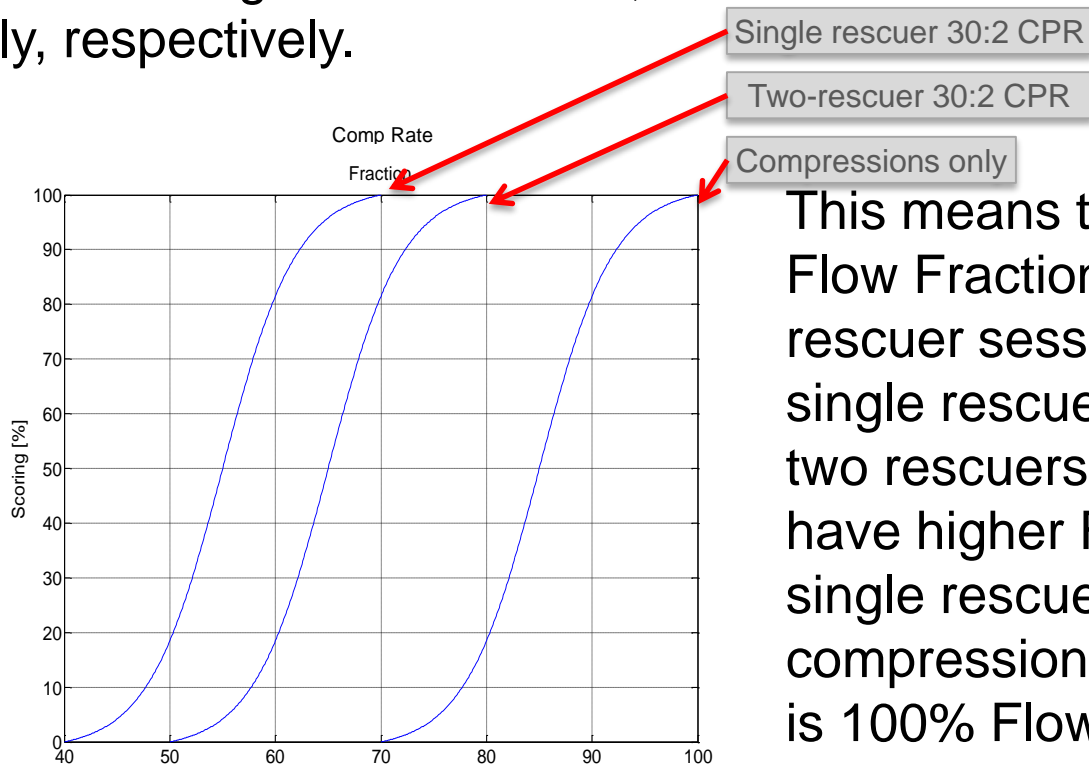
Example 2: Hand position, newborn CPR

The curve shows score on hand position for new-born. The scoring will never go below 50% even if all hand positions are wrong as long as the ventilations are performed perfect. This is because ventilation is weighted 50 % for newborn.



Example 3: Flow Fraction on adult patient

Flow Fraction (or Chest Compression Fraction) is scored according to the chosen algorithm. The below graphs show the Flow Fraction score for Single rescuer CPR, Two-rescuer CPR and Compressions only, respectively.



This means that the scoring on Flow Fraction is stricter for two-rescuer sessions than for single rescuer sessions, since two rescuers should be able to have higher Flow Fraction than single rescuers. For compressions only, the target is 100% Flow Fraction.

CPR score VS Scenario scoring

There are two ways of presenting the score, one for basic *CPR* sessions and one for more complex *Scenarios*. If you run a basic *CPR* session involving only compression and ventilations, you get one overall score as explained.

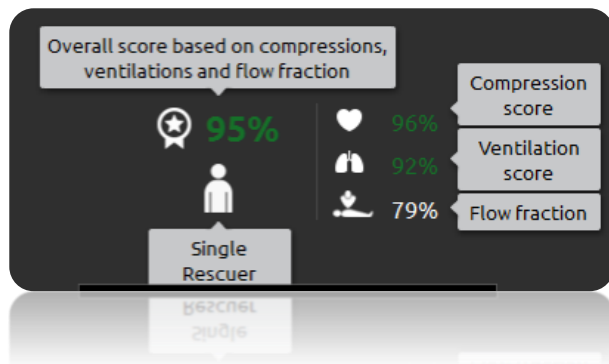
If you run a more complex *scenario* (including tasks like *Call for help, Check breathing* and such) or AED training, the Flow Fraction will in most cases be too low to get a good score. For these sessions, we take out the Flow Fraction from the score, and present that side by side to the CPR score (see illustration next page).

In these situations, instructors must use the score (consisting of compression score and ventilation score) and assess that together with the Flow Fraction percentage, to give a full and meaningful assessment of a session.

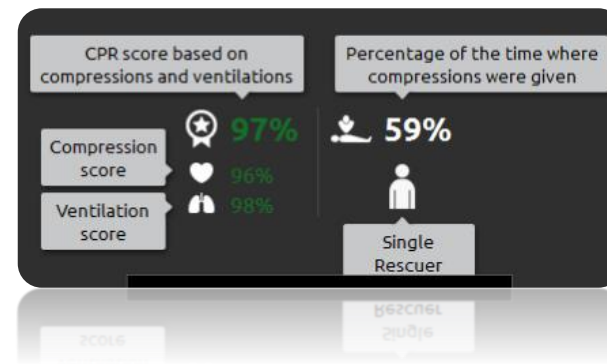
Except for taking out the flow fraction from the score, the logged tasks do not affect the score.

CPR score VS Scenario score

CPR score



Scenario score



- So, for scenario scoring, even with a relatively low Flow fraction (above, right) the score for compressions and ventilations is still fair. The flow fraction number (59% above) must be evaluated in relation to the scenario (i.e. long pauses for defibrillator analysis gives lower flow fraction).

Disclaimer

- This scoring algorithm for AHA has been developed in close collaboration with members of the AHA ECC Subcommittees and co-authors of the 2013 AHA Consensus Statement on CPR Quality.
- Scoring supports instructor-based, as well as computer-based, training and assessment in compliance with the most current AHA Guidelines for CPR and ECC.
- Thresholds for earning points are based on clinical evidence and, where none exists, on the consensus of experts in resuscitation and education. Hence, performance that has been shown to have diminished clinical effect is scored lowest. Scores generated from non-Guideline protocols or sequences will most often render lower scores.
- In AHA-controlled programs, such as Heartcode and RQI, only the AHA scoring algorithm is available to users. Administrators of non-AHA programs may select custom scoring thresholds to conform with their local protocols.
- The scoring for NLS guidelines has been developed in collaboration with Technical Equipment Lead for the NLS sub committee (RCUK)