# GRACE ACS Risk and Mortality Calculator

## INPUTS

|  |  |
| --- | --- |
| Age | **Options:** |
| Heart rate/pulse | **Options:** |
| Systolic BP | **Options:** |
| Creatinine | **Options:** |
| Cardiac arrest at admission | **Options:**   * No * Yes |
| ST segment deviation on EKG? | **Options:**   * No * Yes |
| Abnormal cardiac enzymes | **Options:**   * No * Yes |
| Killip class (signs/symptoms) | **Options:**   * No CHF * Rales and/or JVD * Pulmonary edema * Cardiogenic shock |

## FORMULA

Nomogram, as detailed under [8. Fox Model for Death between Hospital Admission and 6 months later](https://www.outcomes-umassmed.org/grace/files/GRACE_RiskModel_Coefficients.pdf).

## FACTS & FIGURES

**Score interpretation:**

|  |  |
| --- | --- |
| Grace Score Range | Mortality Risk |
| 0-87 | 0-2% |
| 88-128 | 3-10% |
| 129-149 | 10-20% |
| 150-173 | 20-30% |
| 174-182 | 40% |
| 183-190 | 50% |
| 191-199 | 60% |
| 200-207 | 70% |
| 208-218 | 80% |
| 219-284 | 90% |
| ≥ 285 | 99% |

## EVIDENCE APPRAISAL

The GRACE (Global Registry of Acute Coronary Events) is a massive, international database of ACS in 94 hospitals in 14 countries which gives it excellent external validity *a priori*.

Patients were entered into the study if they had ACS:

* Signs or symptoms of acute cardiac ischemia **plus**:
  + EKG findings consistent with ACS or
  + Cardiac biomarker serial increases consistent with ACS or
  + Documented coronary artery disease.
* This ACS could not be secondary to trauma, surgery, or other significant co-morbidity.
* In-hospital mortality status was available in 98.1% of the 11,389 ACS patients studied.
* 22% of the in-hospital deaths occurred within 24 hours of admission, suggesting that this registry contains a very sick cohort of patients.

Of note, the GRACE 2.0 evaluated variables for non-linear mortality associations (thus providing a more accurate estimate of outcome). GRACE 2.0 also includes mortality estimates up to 3 years after the ACS event via several other data sets with longer followup windows.