# Assignment 1 MIMIC-IV Data Dictionary

## Overview

This dataset contains first-day ICU patient data from MIMIC-IV, designed for two predictive tasks:

1. **Classifying the most severe Acute Kidney Injury (AKI) stage** a patient will experience during their ICU stay.
2. **Predicting hospital mortality**.

## Column Descriptions

### ****Identifiers & Outcomes****

* **id**: Unique patient identifier.
* **hospital\_mortality**: Binary indicator (0=alive, 1=deceased) of whether the patient died during hospitalization.
* **aki\_stage**: Most severe **Acute Kidney Injury (AKI) stage** the patient reached during ICU stay (0 = No AKI, 1-3 = Increasing severity levels).

### ****Demographics****

* **gender**: Patient’s gender.
* **admission\_age**: Age at hospital admission.
* **race**: Self-reported racial/ethnic category.

### ****Vital Signs****

* **heart\_rate\_min, heart\_rate\_max, heart\_rate\_mean**: Heart rate (beats per minute).
* **sbp\_min, sbp\_max, sbp\_mean**: Systolic blood pressure (mmHg).
* **dbp\_min, dbp\_max, dbp\_mean**: Diastolic blood pressure (mmHg).
* **mbp\_min, mbp\_max, mbp\_mean**: Mean arterial pressure (mmHg).
* **resp\_rate\_min, resp\_rate\_max, resp\_rate\_mean**: Respiratory rate (breaths per minute).
* **temperature\_vital\_min, temperature\_vital\_max, temperature\_vital\_mean**: Body temperature (°C or °F).
* **spo2\_min, spo2\_max, spo2\_mean**: Oxygen saturation in the blood (%).
* **glucose\_vital\_min, glucose\_vital\_max, glucose\_vital\_mean**: Bedside blood glucose (mg/dL).

### ****Blood Gas Parameters (from Blood Gas Tests)****

* **lactate\_min, lactate\_max**: Lactate levels (indicator of tissue hypoxia, mg/dL).
* **ph\_min, ph\_max**: Blood pH (acidity or alkalinity of blood).
* **so2\_min, so2\_max**: Oxygen saturation measured from blood gas (%).
* **po2\_min, po2\_max**: Partial pressure of oxygen (mmHg).
* **pco2\_min, pco2\_max**: Partial pressure of carbon dioxide (mmHg).
* **aado2\_min, aado2\_max**: Alveolar-arterial oxygen gradient (mmHg, used to assess lung function).
* **aado2\_calc\_min, aado2\_calc\_max**: Calculated alveolar-arterial oxygen gradient.
* **pao2fio2ratio\_min, pao2fio2ratio\_max**: Ratio of arterial oxygen partial pressure to fractional inspired oxygen (assesses respiratory failure severity).
* **baseexcess\_min, baseexcess\_max**: Base excess in blood (marker of metabolic acidosis/alkalosis).
* **bicarbonate\_bg\_min, bicarbonate\_bg\_max**: Bicarbonate levels (key acid-base balance component, mmol/L).
* **totalco2\_min, totalco2\_max**: Total carbon dioxide levels.
* **hematocrit\_bg\_min, hematocrit\_bg\_max**: Percentage of red blood cells in blood.
* **hemoglobin\_bg\_min, hemoglobin\_bg\_max**: Hemoglobin concentration (g/dL, oxygen-carrying protein in red blood cells).
* **carboxyhemoglobin\_min, carboxyhemoglobin\_max**: Carboxyhemoglobin level (indicates carbon monoxide exposure or smoking history).
* **methemoglobin\_min, methemoglobin\_max**: Methemoglobin level (abnormal hemoglobin form affecting oxygen transport).
* **temperature\_bg\_min, temperature\_bg\_max**: Blood temperature (°C or °F).
* **chloride\_bg\_min, chloride\_bg\_max**: Chloride levels (electrolyte balance, mmol/L).
* **calcium\_bg\_min, calcium\_bg\_max**: Blood calcium levels (important for heart, muscle, and nerve function, mg/dL).
* **glucose\_bg\_min, glucose\_bg\_max**: Blood glucose from blood gas analysis (mg/dL).
* **potassium\_bg\_min, potassium\_bg\_max**: Potassium levels (electrolyte critical for heart and muscle function, mmol/L).
* **sodium\_bg\_min, sodium\_bg\_max**: Sodium levels (electrolyte balance, mmol/L).

### ****Laboratory Test Results****

* **hematocrit\_lab\_min, hematocrit\_lab\_max**: Hematocrit percentage from lab tests.
* **hemoglobin\_lab\_min, hemoglobin\_lab\_max**: Hemoglobin concentration from lab tests.
* **platelets\_min, platelets\_max**: Platelet count (cells responsible for clotting, 10³/μL).
* **wbc\_min, wbc\_max**: White blood cell count (immune response, 10³/μL).
* **albumin\_min, albumin\_max**: Albumin (key blood protein, low levels indicate malnutrition or liver/kidney disease, g/dL).
* **globulin\_min, globulin\_max**: Globulin (immune system protein, g/dL).
* **total\_protein\_min, total\_protein\_max**: Total serum protein levels (g/dL).
* **aniongap\_min, aniongap\_max**: Anion gap (used to detect acid-base disorders, mmol/L).
* **bicarbonate\_lab\_min, bicarbonate\_lab\_max**: Bicarbonate from lab tests.
* **bun\_min, bun\_max**: Blood urea nitrogen (marker of kidney function, mg/dL).
* **calcium\_lab\_min, calcium\_lab\_max**: Blood calcium from lab tests.
* **chloride\_lab\_min, chloride\_lab\_max**: Chloride from lab tests.
* **creatinine\_min, creatinine\_max**: Creatinine levels (marker of kidney function, mg/dL).
* **glucose\_lab\_min, glucose\_lab\_max**: Blood glucose from lab chemistry tests.
* **sodium\_lab\_min, sodium\_lab\_max**: Sodium from lab tests.
* **potassium\_lab\_min, potassium\_lab\_max**: Potassium from lab tests.

### ****Complete Blood Count & Coagulation Markers****

* **abs\_basophils\_min, abs\_basophils\_max**: Absolute basophil count (involved in allergic reactions).
* **abs\_eosinophils\_min, abs\_eosinophils\_max**: Absolute eosinophil count (related to allergies and parasitic infections).
* **abs\_lymphocytes\_min, abs\_lymphocytes\_max**: Absolute lymphocyte count (key immune cells).
* **abs\_monocytes\_min, abs\_monocytes\_max**: Absolute monocyte count (inflammation and immune response).
* **abs\_neutrophils\_min, abs\_neutrophils\_max**: Absolute neutrophil count (first-line infection fighters).
* **inr\_min, inr\_max**: International Normalized Ratio (INR, blood clotting time measure).
* **pt\_min, pt\_max**: Prothrombin time (PT, clotting function test).
* **ptt\_min, ptt\_max**: Partial thromboplastin time (PTT, evaluates clotting disorder risk).

### ****Liver & Cardiac Markers****

* **alt\_min, alt\_max**: Alanine transaminase (ALT, liver enzyme, marker of liver damage).
* **alp\_min, alp\_max**: Alkaline phosphatase (ALP, liver and bone enzyme).
* **ast\_min, ast\_max**: Aspartate transaminase (AST, liver and heart enzyme).
* **bilirubin\_total\_min, bilirubin\_total\_max**: Total bilirubin (indicator of liver function and red blood cell breakdown).
* **ck\_cpk\_min, ck\_cpk\_max**: Creatine kinase (CK, muscle and heart damage marker).

### ****Neurological & Anthropometric Data****

* **gcs\_min**: Glasgow Coma Scale total score (neurological function assessment).
* **height**: Patient height (cm).
* **weight\_admit**: Admission weight (kg).

urine\_output