Nomogram

A nomogram is a graphical representation of a mathematical model or formula that allows for the prediction of a specific outcome or risk associated with a particular set of variables. It is a valuable tool in statistics, medicine, engineering, and various other fields where complex relationships between multiple variables need to be simplified for practical use.

Key features of a nomogram include:

Variables: A nomogram typically involves several variables or factors that can influence the outcome of interest. These variables may be quantitative (numeric) or qualitative (categorical).

Scales: Each variable on a nomogram is represented along a scale or axis. These scales are often logarithmic or nonlinear to account for the different impacts of each variable.

Lines or curves: Lines or curves connect values of the variables on the scales to indicate the relationship between them. The way these lines or curves intersect provides a way to calculate the outcome or risk.

Outcome or risk prediction: By aligning the values of the variables on the scales and following the lines or curves to their intersection point, one can read off the predicted outcome or risk based on the values of the input variables.

Nomograms are especially useful when dealing with predictive models that have complex mathematical relationships or multiple variables. They offer several advantages:

Visual representation: They provide an intuitive and easy-to-understand way to interpret the relationships between variables and predict outcomes.

No need for calculations: Nomograms eliminate the need for manual calculations or complex formula applications, making them user-friendly.

Rapid assessment: Medical professionals often use nomograms to estimate a patient's risk for a particular condition or to determine the best course of treatment quickly.

Clinical decision support: In healthcare, nomograms are commonly used for risk assessment in fields such as oncology (e.g., predicting cancer survival rates), cardiology (e.g., predicting cardiovascular risks), and more.

Transparency: Nomograms make it easier to understand and communicate complex models and their predictions to both professionals and patients.

Overall, nomograms are valuable tools for making informed decisions and predictions based on multiple variables and can be found in various domains where predictive modeling is crucial.

A study aimed the validation and efficacy the multiplication of neutrophils and monocytes (MNM) and a novel dynamic nomogram for predicting in-hospital death in patients with aneurysmal subarachnoid hemorrhage (aSAH).

The Retrospective study was done on 986 patients with endovascular coiling for aSAH. Independent risk factors associated with in-hospital death were identified using both univariate and multivariate logistic regression analysis. In the development cohort, a dynamic nomogram of in-hospital deaths was introduced and made available online as a straightforward calculator. To predict the in-hospital death from the external validation cohort by nomogram, calibration analysis, decision curve analysis, and receiver operating characteristic analysis were carried out.

Results: 72/687 patients (10.5%) in the development cohort and 31/299 patients (10.4%) in the validation cohort died. MNM was linked to in-hospital death in univariate and multivariate regression studies. In the development cohort, a unique nomogram demonstrated a high prediction ability for in-hospital death. According to the calibration curves, the nomogram has a reliable degree of consistency and calibration. With threshold probabilities between 10% and 90%, the nomogram's net benefit was superior to the basic model. The MNM and nomogram also exhibited good predictive values for in-hospital death in the validation cohort.

MNM is a novel predictor of in-hospital mortality in patients with aSAH. For aSAH patients, a dynamic nomogram is a useful technique for predicting in-hospital death [1)]

https://dzzhuang.shinyapps.io/outcome_of_asah/

The purpose of a study was to establish and validate a nomogram to estimate the 30-day probability of death in patients with spontaneous intracerebral hemorrhage.. From January 2015 to December 2017, a cohort of 450 patients with clinically diagnosed cerebral hemorrhage was collected for model development. The minimum absolute contraction and the selection operator (lasso) regression model were used to select the strongest prediction of patients with cerebral hemorrhage. Discrimination and calibration were used to evaluate the performance of the resulting nomogram. After internal validation, the nomogram was further assessed in a different cohort containing 148 consecutive subjects examined between January 2018 and December 2018. The nomogram included five predictors from the lasso regression analysis, including Glasgow coma scale (GCS), hematoma location, hematoma volume, white blood cells, and D-dimer. Internal verification showed that the model had good discrimination, (the area under the curve is 0.955), and good calibration [unreliability (U) statistic, p = 0.739]. The nomogram still showed good discrimination (area under the curve = 0.888) and good calibration [U statistic, p = 0.926] in the verification cohort data. Decision curve analysis showed that the prediction nomogram was clinically useful. The current study delineates a predictive nomogram combining clinical and imaging features, which can help identify patients who may die of a cerebral hemorrhage [2)].

1)
Li T, Zhuang D, Xiao Y, Chen X, Zhong Y, Ou X, Peng H, Wang S, Chen W, Sheng J. A dynamic online nomogram for predicting death in hospital after aneurysmal subarachnoid hemorrhage. Eur J Med Res. 2023 Oct 12;28(1):432. doi: 10.1186/s40001-023-01417-8. PMID: 37828549.
2)
Han Q, Li M, Su D, Fu A, Li L, Chen T. Development and validation of a 30-day death nomogram in patients with spontaneous cerebral hemorrhage: a retrospective cohort study. Acta Neurol Belg. 2021 Feb 10. doi: 10.1007/s13760-021-01617-1. Epub ahead of print. PMID: 33566335.