

A recent study published in the *Scientific Reports* journal just 2 days ago revealed that hypertension was not a predictor of perioperative cardiac arrest. This finding is surprising and totally unexpected. Read the whole article for more data.

Sci Rep. 2022 Aug 12;12(1):13709. doi: 10.1038/s41598-022-17916-3.

## A retrospective study of mortality for perioperative cardiac arrests toward a personalized treatment

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### Abstract

Perioperative cardiac arrest (POCA) is associated with a high mortality rate. This work aimed to study its prognostic factors for risk mitigation by means of care management and planning. A database of 380,919 surgeries was reviewed, and 150 POCAs were curated. The main outcome was mortality prior to hospital discharge. Patient demographic, medical history, and clinical characteristics (anesthesia and surgery) were the main features. Six machine learning (ML) algorithms, including LR, SVC, RF, GBM, AdaBoost, and VotingClassifier, were explored. The last algorithm was an ensemble of the first five algorithms. k-fold cross-validation and bootstrapping minimized the prediction bias and variance, respectively. Explainers (SHAP and LIME) were used to interpret the predictions. The ensemble provided the most accurate and robust predictions (AUC = 0.90 [95% CI, 0.78-0.98]) across various age groups. The risk factors were identified by order of importance. Surprisingly, the comorbidity of hypertension was found to have a protective effect on survival, which was reported by a recent study for the first time to our knowledge. The validated ensemble classifier in aid of the explainers improved the predictive differentiation, thereby deepening our understanding of POCA prognostication. It offers a holistic model-based approach for personalized anesthesia and surgical treatment.

A recent study published by the Open Heart journal which tested the predictive value of interarm blood pressure difference in detecting the severity of coronary artery disease found a strong predictive value of the IABPD. Read the whole article for more information.

Open Heart. 2022 Aug;9(2):e002063. doi: 10.1136/openhrt-2022-002063.

## Inter-arm blood pressure difference as a tool for predicting coronary artery disease severity

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### Abstract

**Background:** Patients with severe atherosclerosis have been found to exhibit considerable changes in blood pressure (BP) between arms. The objective of our study was to investigate the predictive value of interarm blood pressure difference (IABPD) for coronary artery disease (CAD) severity.

**Methods:** It was a cross-sectional study conducted in the Department of Cardiology, Chittagong Medical College Hospital, Chattogram from May 2020 to November 2020. The study conveniently selected 110 individuals who visited the department for a coronary angiography during the study period. The BP of both arms were synchronously measured 1-2 days before the coronary angiography and IABPD were calculated. After coronary angiography, two blinded interventional cardiologists visually estimated the amount of coronary artery obstruction and determined the Gensini score.

**Results:** Among the participants, more than three-fourths of the patients were above 50 years of age (64.66%), and the majority were male (86.67%). 14.7% of participants had no occlusion in their coronary artery, 38.0% of participants had insignificant occlusion, 26.7% participants had mild occlusion, 10.3% participants had moderate occlusion, 3.3% participants had significant occlusion and 6.0% participants had total occlusion. Corrected pulse IABPD (cIABPDpulse) showed the greatest area under the receiver operating characteristic curve (0.73) for predicting a high Gensini score (>median). Multiple regression analysis revealed a significant relationship between corrected systolic IABPD (cIABPDsys) and the Gensini score ( $B=0.057$ ,  $p<0.001$ ).

**Conclusion:** The differences in BP between the arms were found to be having a strong positive correlation with CAD severity.

**Keywords:** Biostatistics; Coronary Angiography; Coronary Artery Disease; Hypertension.

A study published in the Georgian Medical News tested the variability of blood pressure in professional athletes during the preparation, competitive and transition. Read the whole article for more data.

Georgian Med News. 2022 May;(326):7-11.

## **LONG-TERM BLOOD PRESSURE VARIABILITY IN STRENGTH AND ENDURANCE PROFESSIONAL ATHLETES WITH OFFICE PREHYPERTENSION OVER ANNUAL TRAINING MACROCYCLE**

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### **Abstract**

Considering the high spreading of arterial hypertension (AH) in professional athletes involved in different types of physical activities, as well as the high probability of its development in individuals with high normal blood pressure (BP), we aimed at investigating the daily profile of BP during three periods of annual training summer macrocycle: the preparation, competitive and transition ones. The investigation included 30 athletes having levels of systolic BP  $\geq 130$  and  $< 140$ ; as well as diastolic BP  $\geq 85$  and  $< 90$  mmHg during a thorough office examination in the preparation phase, who were divided into two groups without changes on age, sex, the duration of the sporting career depending on the type of a performed physical activity - strength (Str) and endurance (End). The athletes underwent office BP measurements and home BP monitoring (over the course of 3-7 days (M=5.2 (0.9) days), medical consultations, anthropometric and clinical examinations on each phase of the macrocycle. Although symptoms of chronic stress and autonomic dysfunction were quite common in athletes with prehypertension, still the emergence of the detected symptoms didn't differ significantly between two groups under investigation. When comparing the average values of office and home BP, the differences between Str-group and End-group regarding all indicators during the competitive phase have been identified. In particular, the levels of home diastolic BP differ the most - in Str-group they amounted to 91.1 (5.5) mm Hg, whereas in Endgroup to 83.7 (5.9) mm Hg ( $p=0.002$ ). Nevertheless, the average maximum home systolic BP in Str-group has exceeded the high normal limit and accounted for 142.5 (10.2) mm Hg, in End-group the same parameter was 133.1 (7.6) mm Hg ( $p=0.019$ ). The spreading of hypertension during preparation, competitive and transition periods in the Str-group has consecutively accounted for 20%, 53.3% and 13.3%.; in End-group the BP has accounted for 6.7%, 13.3% and 6.7% respectively, herewith during the competitive phase that indicator in Str-group was much higher ( $p=0.02$ ), and the relative risk of developing hypertension during the

competitive phase equaled 4 ( $p=0.048$ ). Therefore, the increase of AH frequency and the level of BP in athletes involved in strength exercises isn't supported by an increase of autonomic symptoms development in comparison to the athletes performing endurance exercises, i.e. the frequency of asymptomatic, masked cases has a tendency to rise. To detect hypertension in time, we suggest performing home BP monitoring for athletes with high normal blood pressure during the competitive period.