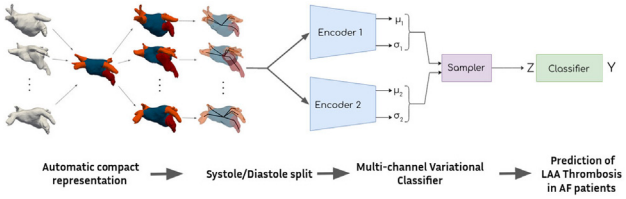
Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Methods: Pts with history of AF and an indication for LAA closure underwent pre-operative cardiac CT. Those with either a prior history of embolism or a clot detected on arterial and venous-enhanced CT images were categorized as clot positive. On CT images, the LA was segmented and meshed. Automated labelling of PVs and LAA was employed to build a compact skeleton representation of the LA (by registering labels from a template to all cases, and by connecting the center of mass of each labels). LA skeletons were used to train a novel Neural Network model for joint classification of heterogeneous data, such as images taken at different phases of the cardiac cycle. Such model consists of one encoder per dataset followed by a common classifier, enforcing a joint representation of all datasets in the same latent space. This is made possible by writing the task as a variational problem to optimise, we call this model a multi-channel variational classifier. The model was trained to predict clot positive patients and its generalizability was assessed on a test population.
Results: 237 pts were included (age 74±8, 70% males, CHA_2DS_2-VASc 4.3±1.2). CTs were acquired during systole in 117 and diastole in 120. 100 (42%) patients were considered clot positive. Segmentation, labeling and skeletization was successfully achieved in all pts. The model was trained using a 10-Fold cross validation. We compared the results after training on diastole and systole cases independently andby jointly training on both datasets. At testing, our model reached a 0.72 overall accuracy for the prediction of LAA clots (0.83 for systole and 0.61 for diastole), while training separately on systole anddiastole was prone to strong overfitting and mode collapse with 0.52 and 0.48 accuracy, respectively.
Conclusion: While LA shape, LA size, PV and LAA orientations alone may not be sufficient for robust clot prediction, we introduce a compressed representation of the global anatomy that closely relates to LAA thrombosis, possibly identifying global features related to adverse hemodynamics. The method is reproducible andintroduces a novel approach to accommodate heterogeneous diastole and systole datasets.



PO-706-05

DECREASE IN ACTIVITY OF DAILY LIVING DURING THE COVID-19 PANDEMIC CORRELATES WITH A DECREASE IN BIOMETRIC VARIABLES

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Background: The COVID-19 pandemic caused home quarantine of majority of US population including patients with CIED. Outpatient remote monitoring can be used to record and analyze basic biometric variables during the months of the pandemic.
Objective: To compare the biometric variables as heart rate and heart rate variability with daily physical activity before and during COVID-19 pandemic in patients with CIED.
Methods: We retrospectively analyzed CareLink™ data transmissions across a large healthcare system prior and during the COVID-19 pandemic.
Results: The cohort included 345,459 transmissions from 4141 patients between March and May in 2019 and 464,003 transmissions from 5371 patients in 2020. When comparing the period of March to May of 2019 to March to May of 2020 there was a significant decrease in daily physical activity (244±153 min vs. 204±143 min; $p< 0.0001$), decrease in day-time average HR (75.3± 9 bpm vs. 74.4±9 bpm; $p< 0.0001$), decrease in night-time average HR (69.0±8.8 bpm vs. 68.2±8.7 bpm; $p< 0.0001$) and decrease HR variability (81.5±30.4 ms vs. 80.2±34.2 ms ; $p< 0.0001$). During March and May of 2020 there was a significant correlation between the daily physical activity and HR variability ($r^2=0.24$; $p < 0.0001$), day-time HR ($r^2=0.32$; $p < 0.0001$) and night-time HR ($r^2=0.02$; $p < 0.0001$).
Conclusion: During the COVID-19 pandemic there was a significant decrease in the daily physical activity in patients with CIED likely from home quarantine that correlated with a decrease in HR variability, day-time HR and night-time HR. The changes in these parameters may adversely affect overall cardiovascular health and outcomes of patients with CIED.

PO-706-06

A DEEP LEARNING-ENABLED ELECTROCARDIOGRAM MODEL FOR THE IDENTIFICATION OF PRESENCE OF ATRIAL FIBRILLATION DURING SINUS RHYTHM

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Background: The instantaneous attack remains a significant challenge as the physician often fails to capture the episodes of paroxysmal atrial fibrillation (AF) to diagnose. The risk stratification to identify the presence of AF is vital for the clinical decision for comprehensive ECG monitoring or treatment.
Objective: We aimed to build an artificial intelligence (AI) model utilizing 12-lead ECGs during sinus rhythm (SR) to predict the presence of undetected AF.
Methods: By a deep neural network, sinus rhythm ECGs from the patients who have been diagnosed as paroxysmal AF were compared to those without any history of AF. The diagnosis of AF was ascertained by either medical records, ECGs, or ambulatory ECGs. All ECGs were randomly stratified into training and holdout test datasets at a ratio of 8:2 with ten-fold cross-validation.
Results: We recruited 8241 SR ECGs from the patients with paroxysmal AF compared to 8241 SR ECGs without AF history, extracted from the hospital-based ECG database. The area under the curve (AUC) of the AI model in detecting the presence of AF during SR was 0.87 (sensitivity: 79.9%, specificity: 79.0%, F1 score 79.5%) in the training set. In the test set, the AUC of the deep learning model in detecting the presence of AF was 0.89 (sensitivity: 78.9%, specificity: 83.5%, F1 score 80.8%).
Conclusion: The AI ECG model could potentially detect the presence of AF even when the patients were during sinus rhythm. This assists in a clinical decision to perform ECG monitoring for an extended period or avoid undue delay in the treatment.