respectively (p < 0.0001). Left ventricular ejection fraction did not differ across the groups. (≤22% with LVEF <50%; p=0.81). Age adjusted survival by RPG category compared with known DM is depicted in Figure 1. Mortality increased by increasing RPG in patients without known DM and was highest in those with known DM (log-rank p <0.0001). Known DM was associated with an increased risk of mortality vs. the lowest RPG category (≥ 6.1 mmol/L; adjusted HR 95% CI 1.51:1.42–1.60). The highest RPG category was associated with increased mortality even among those without known DM (adjusted HR 1.17; CI 1.08–1.25 comparing ≥7.0 vs. <6.1 mmol/L). There was no increased mortality risk comparing the slightly elevated vs. lowest RPG category (6.1–6.9 vs. <6.1 mmol/L; adjusted HR 1.04:0.96–1.11).

Conclusions: In patients with heart failure without previously reported DM, increased levels of RPG were associated with greater risk of long-term mortality compared with lower RPG levels. DM was as expected associated with the highest risk of these findings. These findings highlight the importance of searching for previously undetected dysglycemia and DM in heart failure populations.

DIGITAL HEALTH IN CLINICAL PRACTICE

1105
Machine-learning analysis of myocardial deformation patterns to predict incident heart failure or death in the general population
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Introduction: Different measurements derived from myocardial strain data have been identified as predictors of outcome in a broad spectrum of cardiac diseases, including heart failure (HF). We hypothesize that the comprehensive analysis of entire deformation patterns, rather than scalar indices (peak, time-to-peak values) extracted from them, can be more informative in identifying subjects at a higher risk of future events.

Methods: In 1997 subjects enrolled in the Atherosclerosis Risk in Communities study (ARIC) we assessed strain patterns at 12 left ventricular locations (2 basal, 2 mid and 2 apical segments; from the 2ch and 4ch apical views) over a cardiac cycle using an unsupervised machine learning algorithm (multiple kernel learning) that positions subjects based on similarities in deformation. A K-means algorithm identified 4 clusters, for which we compared baseline characteristics and the primary outcome of death or HF event.

Results: The unsupervised analysis of deformation patterns identified 4 clinically-distinct clusters (Figure) with distinct clinical characteristics. One such cluster (Cluster 3) comprised the highest proportion of hypertensive patients (85.2%, 54.1% for age, sex, systolic blood pressure, prevalent coronary heart disease and prevalent atrial fibrillation (HR 2.62 (1.24–4.46); p <0.001).

Conclusion: Our results serve as a proof-of-concept that unsupervised machine learning-based analysis of deformation patterns canagnostically identify subjects at a substantially higher risk of incident HF or death and confirm prior clinical knowledge.

Funding Acknowledgements: National Heart, Lung, and Blood Institute contracts (N01-HC-28210, N01-HC-28286, N01-HC-28287, N01-HC-28289); and the ‘Fundació La Marató de TV3’ (no. 20154031, Barcelona, Spain)

1106
Validity of activity data collected by mobile Apple devices - Testing a new telemedical care concept for patients after hospitalization for heart failure

Background: Due to the widespread use of mobile devices like smart watches and smart phones, ‘mobile health’ (mhealth-) applications open up promising possibilities of biomedical data collection and telemedical care concepts. However, sufficient evidence on data quality and the clinical benefit of these mhealth-concepts is often missing.

Purpose: This abstract presents the results of a pilot study testing a new telemedical care concept designed for patients with newly diagnosed heart failure and hypertension. The study aimed to evaluate the clinical relevance of mhealth data collected by mobile devices, a comparison of the device-related data with those of standardized clinical examinations was performed.

Materials and methods: The tested telemonitoring platform was designed for the Apple Watch (Apple Inc., Cupertino, CA). This comprises an active part for the patient that consists of daily input of relevant clinical data (blood pressure, bodyweight, symptoms, drug intake) into the iPhone App. The App has access to health-related data as heart frequency and daily steps that are measured passively during the day. All biomedical data are transferred continuously to the doctor in charge using encrypted connections.

In the present feasibility trial, the mHealth concept was tested over a period of two months in ten study participants who were hospitalized for newly diagnosed heart failure (LVEF <40%, NYHA III). The duration of the study, patients were provided an iPhone 6 SE as well as a first generation Apple Watch. At study inclusion as well as after one and two months, participants underwent the following examinations: transthoracic echocardiography, NTproBNP is., spirometry, questionnaires for heart failure and anxiety, 4 days Holter ECG, 6 minute walk test (6MWT). A device-based 6 MWT was opposed to the standard 6 MWT.

Results: In questionnaires, the app received good values for usability and patient acceptance. Over the study period, the weekly average of daily steps showed a significant increase (2880 steps/day ± 2158 at study inclusion and 6095 steps/day ± 4158 at the end of study; p<0.001) that correlated with an improvement of conventional parameters (LVEF in TTE, NTproBNP, spirometry). The walking distance of the standard 6 MWT (578 m ± 166) didn’t differ significantly from that of the device-related 6 MWT (vs. 520 m ± 111), but showed a strong correlation (r=0.929; p<0.001). A head-to-head comparison of heart frequency data measured by the Apple Watch with those of Holter ECGs will be presented.

Conclusion: Our pilot study shows that the developed mhealth- concept is suitable to telemonitor patients with heart failure. Device-collected activity data promised a strong correlation to gold standard clinical health-related data as heart frequency and daily steps. mhealth-applications may therefore be regarded as promising tools for telemedical care concepts and possible endpoints in clinical heart failure studies.

1107
Improved healthcare cost by reducing all unnecessary hospital admissions beyond 30-day readmissions: a new clinical model using interreality care for value-based paradigm
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1Digital Health, Sunrise, United States of America; 2Memorial Health Network, Hollywood, United States of America

Background: Reduction of 30-day hospital readmissions has been challenged in all hospitals in the paradigm shift from volume-based to value-based new healthcare in the US. It is even more difficult to reduce all unnecessary hospital admissions beyond readmissions due to intensive clinical care needs outside the hospital. Although telemedicine has been proposed as a new approach to reduce hospital readmissions, the current technology and clinical support are insufficient to provide care for high risk populations.

Methods: In addition to Conventional Care (CC: hospital/clinic), an Interreality Care (IRC) service was created for patients outside of the hospital with integration of: 1. CC; 2. On-Site Care using mid-level providers and testing (vitals, labs, imaging) at patients’ residency; and 3. On-Line Care using 24/7 monitoring and specialty intervention (cardiology and pulmonology). A group of 112 Medicare patients with multiple hospitalizations were included in the study. The duration of each hospitalization (General wards and ICU) and costs for the hospital stays for healthcare were compared between CC and IRC.

Results: The average number of hospitalizations per patient was 4.2 in CC and
0.8 in IRC. The average healthcare cost per patient was $59,980 for CC and $11,850 for IRC. The overall net cost savings between CC and IRC was $4.9M for healthcare.

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<td>Admissions/Readmissions</td>
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Conclusion: Our study's primary aim was to examine the model of reduction of both unnecessary hospital admissions and readmissions using the integration of IRC. The preliminary results demonstrated that IRC with integrated Hospital, Clinical, and Online care for patients at home can improve both quality and the cost of care, not only for 30-day readmissions, but for all healthcare admissions. Further study is warranted to examine the implementation and scalability of the new model in a variety of healthcare settings, such as ACO, HMO and public health worldwide.

1108 Post-ablation outcome monitoring using a pulse-deriving smartphone application

Post-ablation outcome monitoring using a pulse-deriving smartphone application

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Objectives: Despite improvements of outcome of ablation for AF, early arrhythmia recurrence is not uncommon up to 3 months post-ablation. Although these arrhythmias are transient and do not represent treatment failure, it is widely recognised as a risk factor for long-term recurrence. To date, a better understanding in the correlation between early and long-term recurrence is hindered by an inability to continuously monitor these patients. We hypothesise that the implementation of a pulse-deriving smartphone application in this population offers the potential to detect early as well as late recurrence in order to initiate proper treatment in a timely manner.

Methods: Four clinical centres included a total of 80 participants who underwent successful AF treatment using ablation therapy. All participants were instructed to measure twice daily with a pulse-deriving smartphone application and additionally when experiencing symptoms, for a monitoring period of 4 months post-ablation. The planned usual-care pathway was registered at study inclusion. All measurements were revised algorithmically and confirmed by the treating physicians and healthcare professionals from a monitoring centre. At time of inclusion and study end a 12-lead ECG was performed.

Results: The mean age of the study population was 66 (±13) years from which 25% was male. Using theCHA2DS2-VASc score, 61% of the participants had an increased stroke risk (i.e. a score of 2 or more). Overall compliance to conduct measurements was recorded at 91% with 2 measurements per day. The smartphone app was able to identify 29 AF-cases (36%) of which 27 paroxysmal and 2 persistent. Only 37% of the AF cases were symptomatic. In the usual care path only 3/29 (10%) cases were identified with 12-lead ECG at the next scheduled visit. The preliminary results demonstrated that IRC with integrated Hospital, Clinical, and Online care for patients at home can improve both quality and the cost of care, not only for 30-day readmissions, but for all healthcare admissions. Further study is warranted to examine the implementation and scalability of the new model in a variety of healthcare settings, such as ACO, HMO and public health worldwide.

1109 Medication reminder apps to improve medication adherence in coronary heart disease patients (MedApp-CHD): a randomised clinical trial

M. Varnfield, M. Gonzalez-Garcia, M. Karunanithi.

Background: Despite proven benefits (reduced re-hospitalisation, morbidity and mortality), only 30–50% of eligible patients participate in cardiac rehabilitation (CR) programmes. Home-based CR programmes have been introduced in an attempt to widen access and participation. Similar to centre-based programmes, a number of research studies of different home-based CR models have reported improved patient outcomes. It is therefore supposed that home-based programmes can help fulfil an over-riding priority that irrespective of gender, age, ethnicity, location, or social status–all patients can use secondary prevention services.

Methods: A mobile app for (m-Health) platform, developed to remotely deliver CR, was previously tested (through a randomised controlled trial) and demonstrated significantly better uptake and completion than, and equal clinical outcomes to that of traditional centre-based CR programmes. The current research aimed to evaluate real world implementation of this m-Health CR programme, through enabling the offering of a variety of tailored CR programme options.

Results: As at the end of recruitment, 359 eligible patients were offered CR at

1110 ‘Real world’ m-Health technology supported home-based cardiac rehabilitation - Are we there yet?

M. Varnfield, M. Gonzalez-Garcia, M. Karunanithi.

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