

Technology to Keep Your Patient's Heart Healthy

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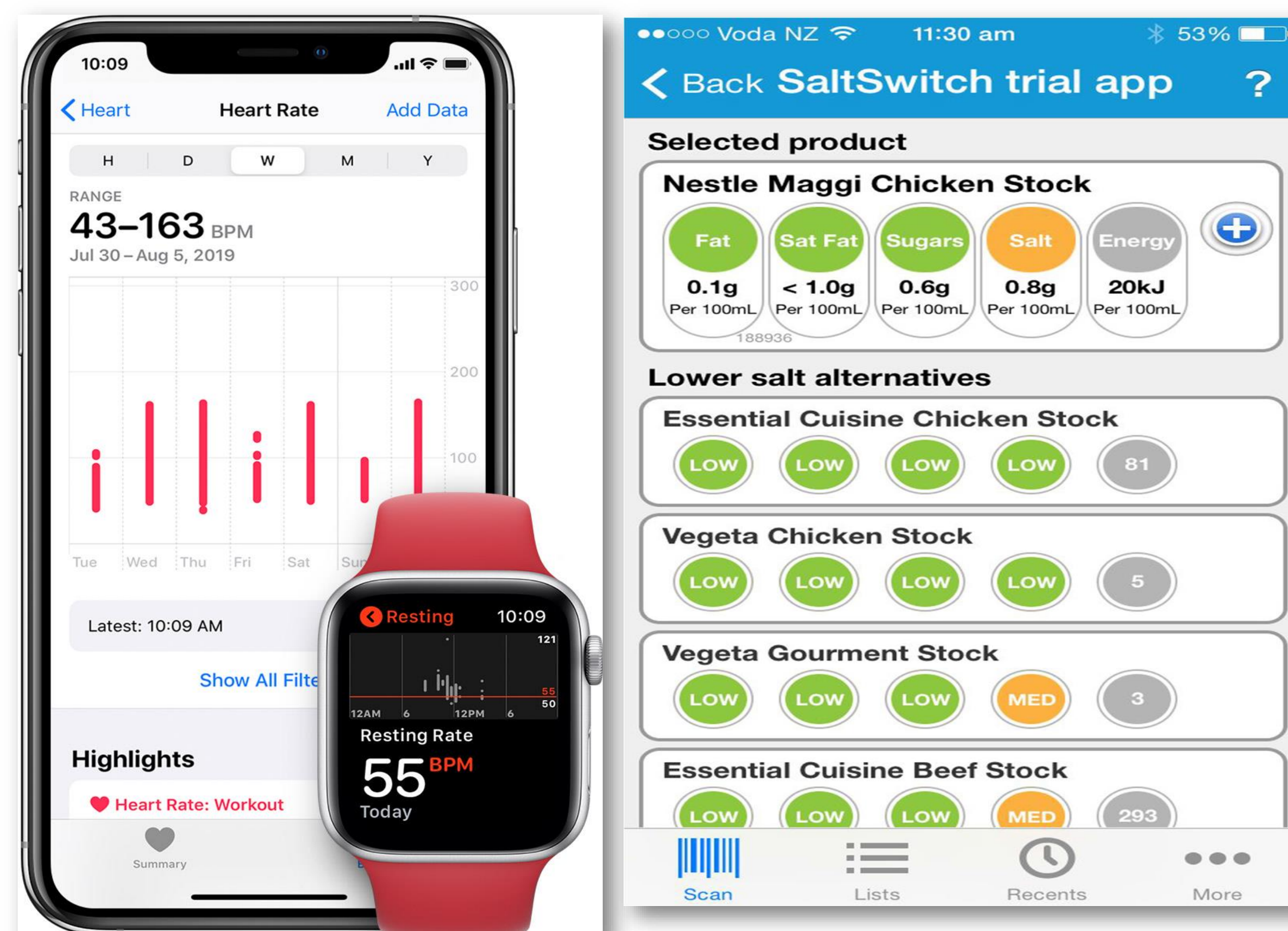
FOR HEALTH SCIENCES

Background

- ♥ Cardiovascular disease is the #1 cause of death and accounts for 30% of all deaths in the world.¹
- ♥ Current healthcare trends lean toward integrating supportive technologies since before electronic medical records were standard.^{2,3}
- ♥ Demand for heart rate monitor technology in the patient populations is increasing. Research supports use of heart rate monitoring with home-based exercises as important in those with or without heart disease.¹
- ♥ The availability of more devices/apps to patients/clients, offers an upsurge of opportunities for data collection and ultimately improving user experiences and interfaces.⁴

Purpose

The purpose of this poster is to describe several heart monitoring devices/apps characteristics by (a) highlighting the different technology modes promoting heart health and, (b) comparing device/apps selection methodology for main features and clinical significance for users.



Retrieved from <https://support.apple.com/en-us/HT204666>

Retrieved from https://www.researchgate.net/figure/The-SaltSwitch-smartphone-application_fig1_265608474

Relevance to Physical Therapy

- ♥ Integrating mobile apps and health and wellness devices such as fitness bands and instant heart rate apps within treatment sessions to monitor patients' vitals in real-time benefit the physical therapy treatment.
- ♥ Increasing productive of treatment sessions, occurs with the ability to receive patient information about baseline measurements prior to the administration of treatment.¹
- ♥ Educating patients and families by physical therapists on use of devices/apps that monitor vitals and aid in maintaining a healthy lifestyle can improve compliance in exercise and lifestyle changes.
- ♥ Decreasing the overall cost of healthcare via technology can be a preventative measure to detect abnormalities early.^{2,4}

Research Methods

- ♥ This literature review examined the characteristics of several heart rate monitoring devices/apps based on (a) different technology modes, (b) intended use and accuracy of the mode, (c) typical application of the devices/apps in maintaining good cardiovascular health.
- ♥ Additionally, the discovery of the descriptions of available technologies that were effective in helping cardiovascular patients stay proactive with managing their risk factors was showcased.
- ♥ A selection methodology for devices/apps was referenced in the literature for choosing or recommending a technology mode, highlighting safety and quality concerns when using the technology mode.

Discussion Points

- ♥ Devices
- ♥ Apple Smart Watch: HR monitoring and movement tracking
 - ♥ Main Features: wrist devices: measures vital parameters → feedback data for patients to track.⁵
 - ♥ Clinical Significance: Apple Smart Watch shows good accuracy vs. gold standard ECG measurements in patients with known heart disease.⁵
- ♥ mHealth
 - ♥ Main Features: Multimodal approach: addresses risk factors such as weight smoking & physical activity; cost constraints limits accessibility.
 - ♥ Clinical Significance: Interactive voice response (IVR) work with any cell or landline phone; easily accessible to low literacy patients and those with decreased vision.¹
- ♥ WCS pulse device
 - ♥ Main Features: non-invasive and a low-cost instrument measures the R-R interval for heart rate.¹⁰
 - ♥ Clinical Significance: has a thoracic transmitter to assess the electric pulse on an individual.¹⁰
- ♥ Apps (via smartphones)
 - ♥ TEXT ME
 - ♥ Main Features: Lifestyle Messaging: ↓cardiovascular risk factors⁶ → advice, motivation & information about improving diet, physical activity levels & smoking cessation.⁶
 - ♥ Clinical Significance: research supports with use a significant risk factor reduction.⁶
 - ♥ SaltSwitch
 - ♥ Main Features: Assist with food selection: preference for foods → lower salt content.⁷
 - ♥ Clinical Significance: Allows consumer to scan the barcode of any packaged food; Output list of healthier choices with lower salt content.
 - ♥ Instant HR
 - ♥ Main Features: Designed output → instant HR reading at any point in the day.⁸
 - ♥ Clinical Significance: Allows HR recording with current activity at any point in the day.⁸
 - ♥ AliveCor: portable EKG (Device & App)
 - ♥ Main Features: self-monitoring device to assess medical-grade EKG in 30 seconds.⁹
 - ♥ Clinical significance: The device uses two steel electrodes to capture EKG & records onto the mobile app & EKGs can also be saved and sent to the doctor.⁹

Data Analysis Characteristics of Selected Heart Rate Monitoring Devices/Apps

App Name// Device/Apps Characteristics	AliveCor	Apple Smart Watch	Instant HR	mHealth	SaltSwitch	TextMe	WCS
Population designed for		General	General	General/ Telehealth	CVD	CHD, T2DM & General	General
Technology mode(s)	KardiaMobile app	Watch Mobile app	Smartphone/ Portal EKG	Multi-modal	Mobile app	Smartphone app	Pulse Device
Intended use/ Typical application	Medical grade EKG in 30 seconds	HR monitoring & movement	Instant HR at any point in day & current activity at any point in day	Address wt., smoking, & physical activity	Aids with selection of healthier food options, decreased salt content	Lifestyle messaging advice, motivation, physical activity & quit smoking	Measure R-r intervals for HR
Unique feature(s)	Detection of normal & abnormal heart rhythm & recorded EKGs can be accessed by MD for eval & Tx	ECG in known pts w/HD	Not reported (NR)	Interactive voice response (IVR); Easily accessible to persons w/ low literacy & decreased vision	Bar code scanning of packaged food to build list of healthier food choices to "Switch"	NR	Uses thoracic transmitter to access electrical pulse
Accuracy	NR	Good accuracy with ECG with pts with known HD	NR	NR	NR	NR	NR

Conclusion

- ♥ Currently, no clear best choice for multiple modes of technology for HR monitoring devices/apps exists.
- ♥ Characteristics of devices/apps drive users' choices. Best choice is mainly a personal or subjective decision rather than objective.
- ♥ Further research assessing accuracy and validity as well as developing a method to improve patient use and compliance is warranted.

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