

Utilization of Smart Watches to Promote Cardiovascular Health in Hot Springs County, WY



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Hypothesis

For high cardiac-risk adults in Hot Springs County, utilization of smart watches will promote cardiovascular health by increasing physical activity and cardiac monitoring in adults.

Background

- Population: 4,618
- Cardiovascular (CVS) disease was the 2nd leading cause of death in Hot Springs County in 2023
- CVS disease risk factors: age, physical inactivity, sex, family history, etc.
 - Mean age in Hot Springs County is 45 years old
 - 26.9% of those between 65–75-year-old and 36.3% of those over 75 years old are inactive
- Local case: patient presents to ER for concern of new onset atrial fibrillation after receiving an alert from their Apple watch



Hot Springs County on a map of Wyoming

Literature Review

Increasing Physical Activity

- Smart watches increase physical activity by 1,800 steps, 40 minutes, and 1kg weight loss.
 - Individual goal setting and health care counseling further increased physical activity.

Detection and Disease Management

- Smart watches with Kardia Band diagnose atrial fibrillation with 93% sensitivity and 84% specificity.
- Smart watches predict heart failure rehospitalizations 6.5 days prior to admission with 76-88% sensitivity and 85% specificity.

Interventional Design

- Clinic staff will offer a free 2-hour CME course for providers. Course will cover:
 - Potential uses of smart watches in a clinical setting
 - Breakdown of the available smart watches and their tracking capabilities
- Hot Springs Public Health will generate education materials on CVS disease and smart watches for the community
- Clinic staff can evaluate efficacy of intervention through:
 - Public health data on local activity levels
 - Hospital statistics on heart failure rehospitalizations

Overview of Smart Watch Capabilities

Sensor	Sample Tracing	Measurement
Accelerometer		Measures the acceleration of the limb or full body.
Photoplethysmography (PPG)		Measures changes in blood volume in the microvascular bed of the target tissue.
Electrocardiogram (ECG)		Measures the electrical activity of the heart.
Seismocardiogram (SCG)		Measures the mechanical activity of the heart (i.e., valve opening/closing).

Hughes A, Shandhi MMH, Master H, Dunn J, Brittain E. Wearable Devices in Cardiovascular Medicine. *Circ Res.* 2023;132(5):652-670. doi:10.1161/CIRCRESAHA.122.322389

Sustainability Considerations

- Timeline:
 - Year 1: offer CME course at Thermopolis and Worland clinics
 - End of Year 1: Clinic staff administer provider survey on project effectiveness.
 - Year 2: re-evaluate or expand to remaining two clinics
- Barriers: cost, privacy concerns, tech support
 - Transparency on privacy risks
 - Intergenerational cooperation to navigate tech issues
 - Fitbit model easiest to navigate



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