

The Role of AI and IoT in Remote Patient Care

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Agenda

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Introduction

- **Precision Medicine:** Tailoring medical treatment to the individual characteristics of each patient, often utilizing genetic information and lifestyle data.
- **Importance of AI and IoT:** These technologies facilitate continuous real-time monitoring, enhancing treatment effectiveness and personalization.
- **Machine Learning (ML) Role:** Employs algorithms that analyze vast amounts of data to identify patterns, improving the ability to predict patient responses to treatments.
- **Goal:** Explore how AI and IoT are reshaping remote patient care, their benefits, challenges, and future implications for healthcare delivery.

Background and Significance

Growing Role Of Ai And IoT In Healthcare

Innovative applications are emerging for remote patient monitoring.

Potential Benefits

- Reduces healthcare costs,
- Improves patient access to care,
- Early detection of health issues.

Global Implications



20%

Could prevent 20% of deaths

and

\$14B

treatment costs savings

Integration of IoT and AI

What are the benefits of integrating IoT and AI in remote patient care systems?

SYNERGISTIC RELATIONSHIP



The integration of IoT and AI offers enhanced data analysis capabilities.

DATA EFFICIENCY



AI technologies improve data handling and analysis, transforming raw IoT data into actionable insights.

REVOLUTIONIZING HEALTHCARE



This integration enhances decision-making, diagnosis, and treatment options.

FUTURE POSSIBILITIES



Leveraging large datasets from IoT devices to develop advanced AI algorithms for more precise healthcare solutions.

Key Benefits of IoT and AI Integration

How are AI-powered wearables enhancing continuous health monitoring for patients?

Comprehensive Data Analysis

- Combines historical hospital data with real-time patient information.
- Offers qualitative and quantitative insights for better care.

Remote Patient Monitoring

- Essential for patients in rural areas with limited access to healthcare facilities.
- Facilitates quick data transfer and emergency response.

Enhanced Diagnostic Measures

- Improves accuracy in disease detection.
- Identifies conditions lacking effective blood tests through predictive analytics.

Patient Empowerment

- Utilizes close-range gesture control and voice commands for easier interaction with devices.
- Increases patient engagement in their own health management.

Improved Clinical Guidelines

- AI provides evidence-based recommendations to healthcare providers.
- Supports disease management and treatment planning across various conditions.

Using AI for Home Care

Advantages of AI

- **Continuous monitoring**
- Adaptive support
- **Tailored interventions** for diverse patient needs

Key Challenges

- **Interplay Between Human Expertise and AI:** Finding the right balance in decision-making.
- **Patient Trust:** Building confidence in AI-driven solutions.
- **Data Privacy and Regulatory Requirements:** Ensuring compliance and protecting sensitive information.
- **Limited Public Datasets:** Hinders the training and validation of AI algorithms.
- **Modeling Complex Human Behaviors:** Accurately capturing and predicting patient interactions with technology.

Challenges in Implementation



- Patients and caregivers must **manage devices**, making accuracy and reliability crucial.
- **Mistakes** in home settings can **lead to severe consequences**.

**Home Care vs.
Hospital Care**



Historical **issues** with home monitoring **devices** (e.g., glucose monitors) show variable results.

**Reliability of
Devices**



Establishing **clear guidelines** for AI integration in home care.

**Standard Operating
Procedures (SOPs)**



- **Lack** of patient **desire for technology**.
- **Limited access** to home care resources.
- **Legislative** hurdles and **shortage** of trained **personnel**.

**Additional
Barriers**

Opportunities for Innovation



- **Developing Care Pathways:** Integrate AI to create personalized care plans and monitor compliance.
- **Planning and Monitoring Care:** Use predictive analytics for timely interventions.

**Leveraging
AI & IoT**



- **Health Informatics:** Explore data integration and utilization.
- **Telecommunications:** Enhance connectivity for remote monitoring.
- **Psychology:** Understand behavioral responses to technology.

**Research & Development
Opportunities**

Pathways of Care



Rethinking Care Delivery

- Focus on early interventions post-discharge to improve patient outcomes and reduce readmissions.
- Develop integrated care models that support patient recovery at home.

Behavioral and Biomedical Insights

- Collect comprehensive data in real-world settings to inform better interventions.
- Use insights to enhance the speed and effectiveness of patient recovery while addressing social determinants of health.

AI in Rural Healthcare Settings

What challenges and opportunities exist for using AI in home care and rural healthcare settings?

Promise of AI in Rural Areas

- Addresses challenges like provider shortages and access issues.
- Automates tasks traditionally handled by healthcare staff, increasing efficiency.

Optimizing AI for Rural Settings

- Tailor AI applications to fit the unique needs and workflows of rural healthcare practices.

Consultative Care Model

- Enhances the way patients interact with multiple healthcare providers through streamlined consults.

Barriers to Adoption

- Transition impact on existing workflows and limited data availability at the point of care.

Barriers to Adoption in Rural Healthcare

Telehealth Accessibility

- Limited broadband services hinder telehealth implementation.
- High costs of infrastructure investments, like EHR systems, pose challenges.

Provider Reluctance

- Concerns over the effectiveness of AI technologies and their fit within existing practices.

Resource Limitations

- Many rural health centers struggle with staff shortages and budget constraints.

Potential Solutions for AI Adoption

Engaging Stakeholders as Co-Producers

- Involve rural healthcare workers in the design and implementation of AI solutions.
- Align AI development with the real needs and experiences of local healthcare providers.

Collaborative Telehealth Innovations

- Partner with companies developing AI tools for agriculture and telehealth.
- Create integrated systems that leverage technology for both healthcare and agricultural productivity.

Developing a Rural IoT Platform

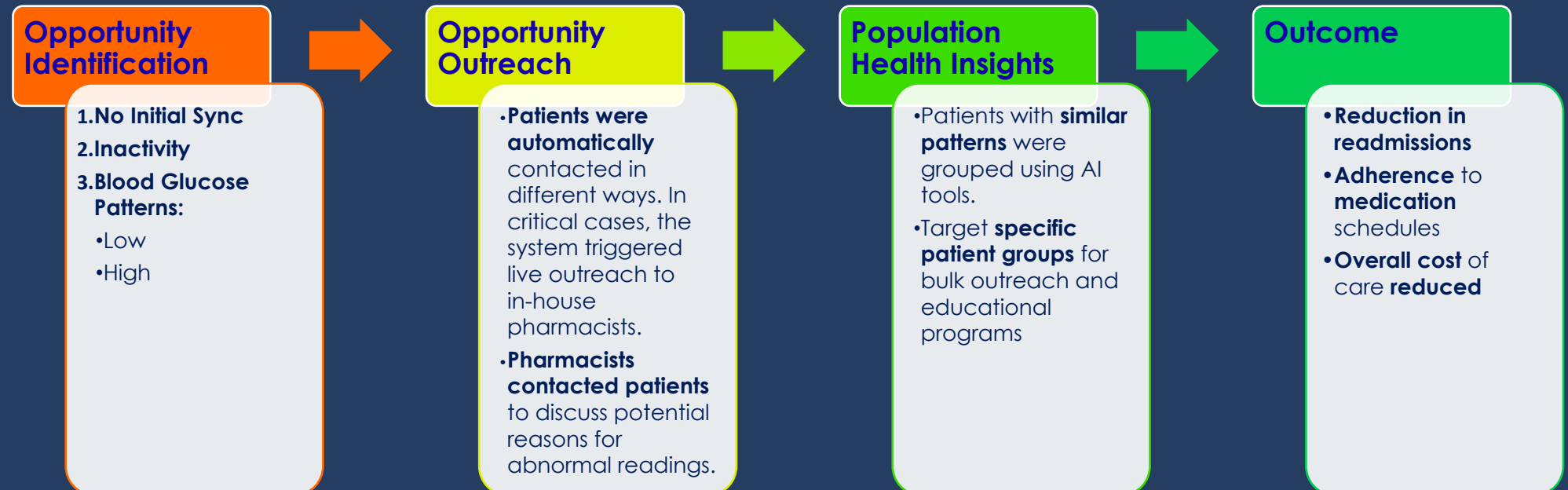
- Establish low-cost, robust IT infrastructure for data collection and analysis.
- Create sensors and cloud systems tailored to rural health needs, facilitating real-time monitoring and decision-making.

Remote Patient Monitoring (RPM) System for Diabetic Patients

Background Remote Patient Monitoring (RPM) system for diabetic patients to **reduce** frequent hospital **readmissions**, **improve adherence** and **reduce healthcare costs** due to poor blood glucose control.

The RPM system collected daily glucose readings from connected devices such as glucose monitors, wearable sensors, and blood pressure cuffs. Using algorithms, the system detected abnormal patterns in blood glucose levels and triggered specific alerts and interventions.

Process



Remote Patient Monitoring (RPM) System for Diabetic Patients

Key Results

- **Reduced** 30-day readmissions by **50%** using a combination of AI-powered technology and remote human care teams.

Hospital
Readmissions



- AI-powered interventions showed a **25-30% increase** in medication adherence.

Medication
Adherence



- **Reduce** per-patient costs by **\$11,472** over standard care.

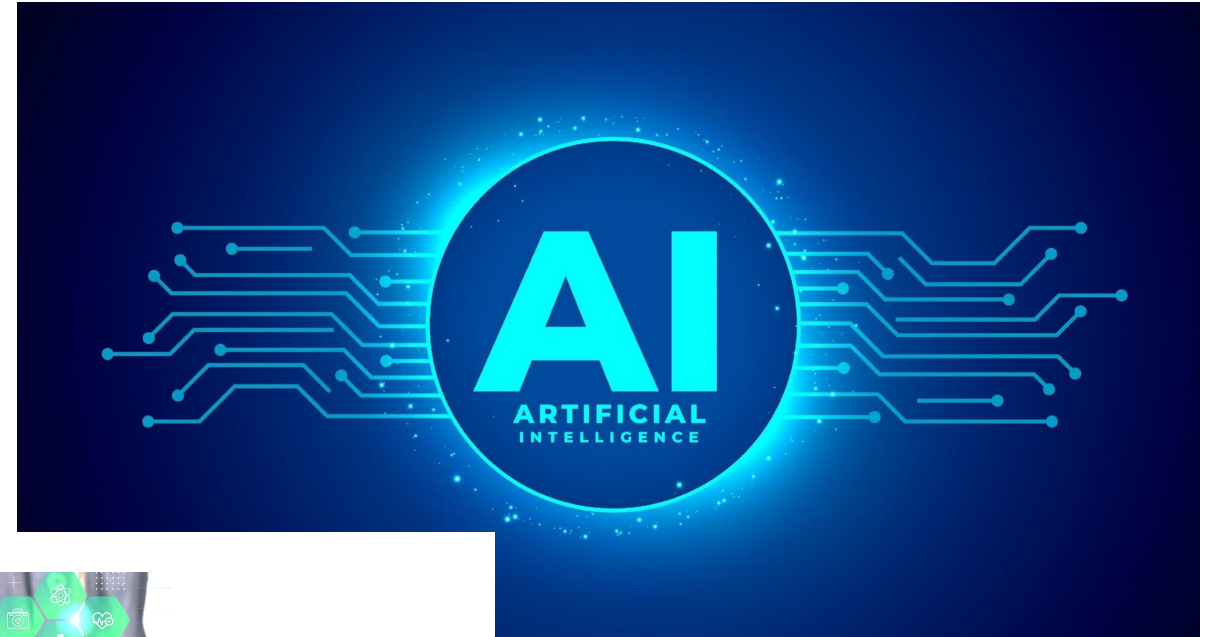
Cost Savings



Takeaways

- **Transformative Potential:** AI and IoT are set to revolutionize remote patient care, particularly in rural settings.
- **Precision Medicine as the Future:** Continuous monitoring and data-driven approaches lead to better patient outcomes.
- Further research, collaboration, and investment in AI and IoT technologies to enhance healthcare delivery in diverse settings.

Q&A



Thank You