TECHNOLOGY & AI CONSIDERATIONS IN AGING

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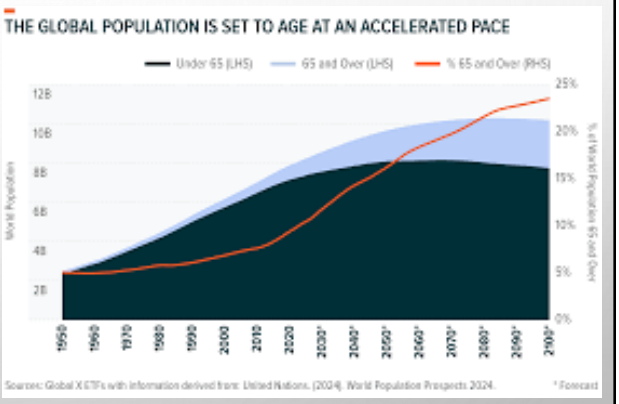
LEARNING OBJECTIVES

- RECOGNIZE AI TECHNOLOGIES IN AGING CARE
- UNDERSTAND BENEFITS AND RISKS
- APPLY THE 4MS FRAMEWORK TO AI TOOLS
- IDENTIFY SAFE CLINICAL USE CASES

LAY OF THE LAND

GLOBAL AGING TRENDS

- LONGER LIFE EXPECTANCY
- MORE CHRONIC CONDITIONS
- WORKFORCE SHORTAGES
- RISING HEALTHCARE DEMAND



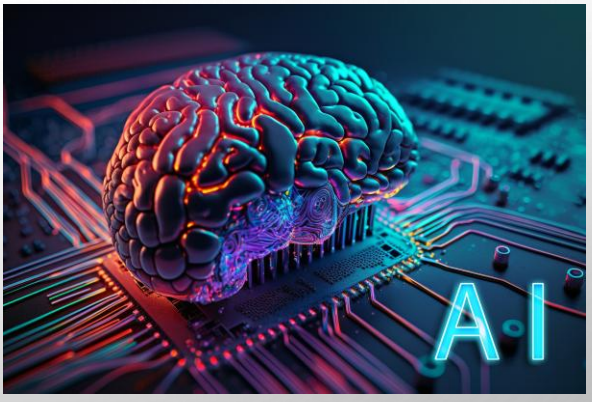
AGE-FRIENDLY HEALTH SYSTEMS

THE 4MS FRAMEWORK

- WHAT MATTERS
- MEDICATION
- MENTATION
- MOBILITY

WHAT IS ARTIFICIAL INTELLIGENCE?

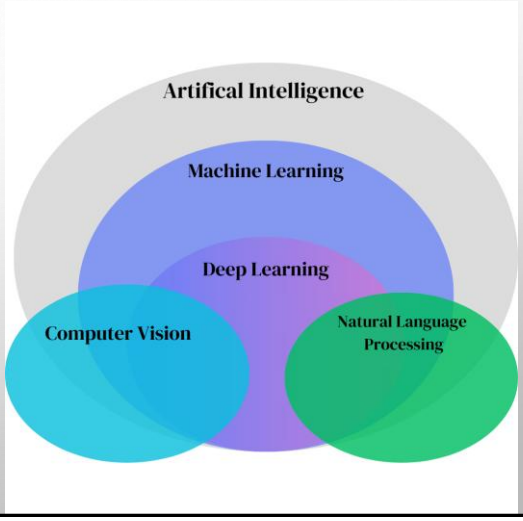
- AI = SYSTEMS THAT CAN
- LEARN FROM DATA
- RECOGNIZE PATTERNS
- MAKE PREDICTIONS
- SUPPORT DECISIONS



TYPES OF AI USED IN HEALTHCARE

KEY APPROACHES

- MACHINE LEARNING
- DEEP LEARNING
- NATURAL LANGUAGE PROCESSING
- COMPUTER VISION



MACHINE LEARNING BASICS

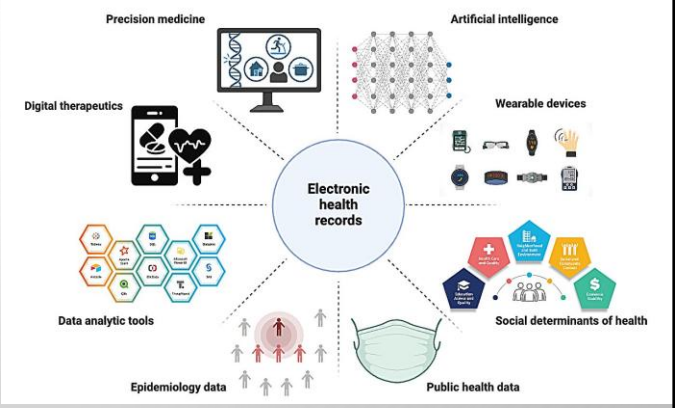
MACHINE LEARNING EXAMPLES

- RISK PREDICTION
- DISEASE DETECTION
- FALL PREDICTION
- TREATMENT OPTIMIZATION

DATA SOURCES FOR AI

AI USES DATA FROM

- ELECTRONIC HEALTH RECORDS
- WEARABLE SENSORS
- MEDICAL IMAGING
- PATIENT-REPORTED OUTCOMES



DIGITAL HEALTH ECOSYSTEM

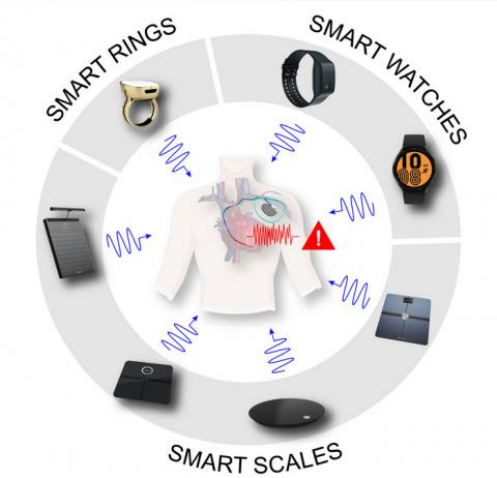
TECHNOLOGY IN AGING CARE

- TELEHEALTH
- WEARABLES
- SMART HOME SENSORS
- REMOTE MONITORING

CASE EXAMPLE: REMOTE MONITORING

CASE: HEART FAILURE PATIENT

- WEARABLE MONITOR
- SMART SCALE
- AI RISK PREDICTION



EMERGING CONCEPT: DIGITAL TWINS

DIGITAL TWIN

- VIRTUAL MODEL OF A PATIENT
- INTEGRATES MULTIPLE DATA STREAMS
- PREDICTS DISEASE PROGRESSION

AI APPLICATIONS IN GERIATRICS

CURRENT APPLICATIONS

- DEMENTIA DETECTION
- FALL RISK PREDICTION
- FRAILTY ASSESSMENT
- MEDICATION MANAGEMENT

AI AND MENTATION

- SPEECH ANALYSIS
- IMAGING INTERPRETATION
- BEHAVIORAL MONITORING

SPEECH IN DEMENTIA: AI-ENABLED LANGUAGE ANALYSIS*

SPEECH BIOMARKERS

- LEXICAL DIVERSITY CHANGES
- SYNTACTIC COMPLEXITY
- WORD-FINDING PAUSES
- NON-INVASIVE COGNITIVE BIOMARKER

*This was supported by the UW Alzheimer's Disease Research Center

AI AND MOBILITY

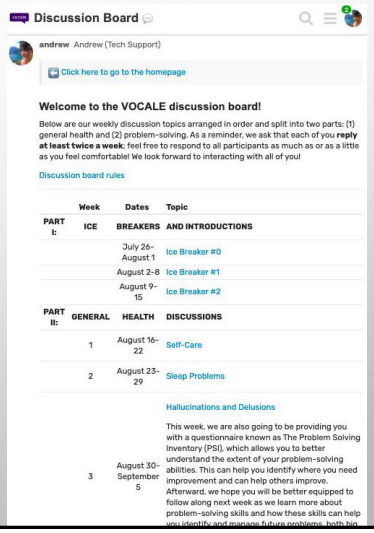
MOBILITY TECHNOLOGIES

- GAIT ANALYSIS
- FALL DETECTION
- SMART WALKERS
- REHABILITATION ROBOTICS

VOCALE FRAILTY: SUPPORTING PERSONS WITH FRAILTY AT CCRS*

PSYCHOEDUCATIONAL LIFESTYLE INTERVENTION

- PHYSICAL ACTIVITY
- NUTRITION OPTIMIZATION
- SLEEP HEALTH
- SOCIAL ENGAGEMENT
- HEALTH PROMOTION BEHAVIORS



*This was supported by the UW SoN dTC for Healthy Aging

AI AND MEDICATION SAFETY

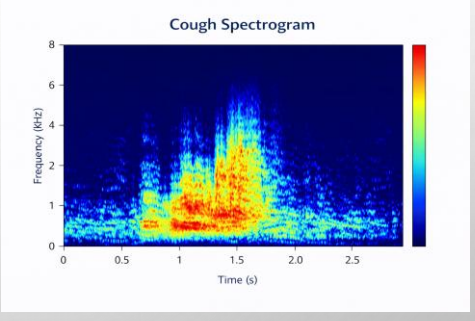
MEDICATION TOOLS

- POLYPHARMACY ALERTS
- DRUG INTERACTION DETECTION
- PERSONALIZED DOSING

SOUNDS IN PNEUMONIA: AI-DRIVEN COUGH ANALYSIS*

ACOUSTIC BIOMARKERS

- EARLY PNEUMONIA DETECTION
- HOME & LONG-TERM CARE DEPLOYMENT
- PREVENT ER VISITS & HOSPITALIZATION
- REDUCE DOWNSTREAM MEDICATION LAYERING



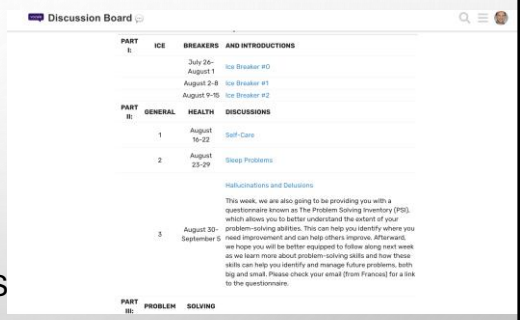
*This was supported by the UW Cross Pacific AI initiative

AI AND WHAT MATTERS

- PATIENT-CENTERED AI
- PERSONALIZED CARE PLANNING
- GOAL-BASED DECISION SUPPORT
- QUALITY-OF-LIFE MONITORING

VOCALE LBD: SUPPORTING CAREGIVERS OF PERSONS WITH LEWY BODY DEMENTIA*

REMOTE ASYNCHRONOUS ENGAGEMENT



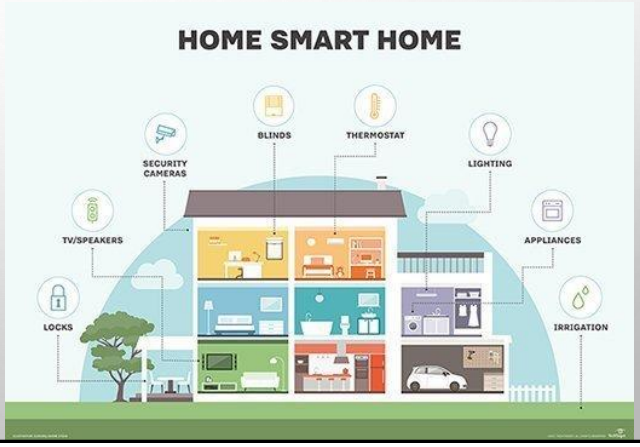
- CAREGIVER REFLECTION IN REAL TIME
- AI-SUPPORTED NARRATIVE SYNTHESIS
- LONGITUDINAL INSIGHT INTO BURDEN & PRIORITIES
- INFORMING GOAL-ALIGNED CARE

*This was supported by the Garvey Institute for Brain Health Solutions, Emory Roybal Center for Dementia Caregiving Mastery

AGING IN PLACE

TECHNOLOGY SUPPORTING INDEPENDENCE

- SMART HOMES
- REMOTE MONITORING
- SOCIAL CONNECTION TOOLS



ROBOTICS IN ELDER CARE

ASSISTIVE ROBOTS

- MEDICATION REMINDERS
- MOBILITY ASSISTANCE
- SOCIAL ENGAGEMENT

POTENTIAL BENEFITS

BENEFITS OF AI

- EARLIER DETECTION
- IMPROVED DIAGNOSIS
- PERSONALIZED TREATMENT
- REDUCED HOSPITALIZATIONS

RISKS AND LIMITATIONS

- DATA PRIVACY
- ALGORITHM BIAS
- CLINICAL VALIDATION
- OVERRELIANCE ON AUTOMATION

ETHICAL CONSIDERATIONS

- TRANSPARENCY
- ACCOUNTABILITY
- EQUITY
- TRUST

DIGITAL DIVIDE

TECHNOLOGY BARRIERS

- ACCESS TO DEVICES
- DIGITAL LITERACY
- AGE-FRIENDLY DESIGN

CO-DESIGN WITH OLDER ADULTS

BETTER DESIGN REQUIRES

- PATIENT INVOLVEMENT
- CAREGIVER INPUT
- CLINICIAN FEEDBACK

IMPLEMENTATION CHALLENGES

- INTEGRATION WITH EHR
- WORKFLOW DISRUPTION
- COST AND REIMBURSEMENT
- TRAINING NEEDS

CLINICAL CASE EXAMPLE

CASE: FALL RISK PREDICTION

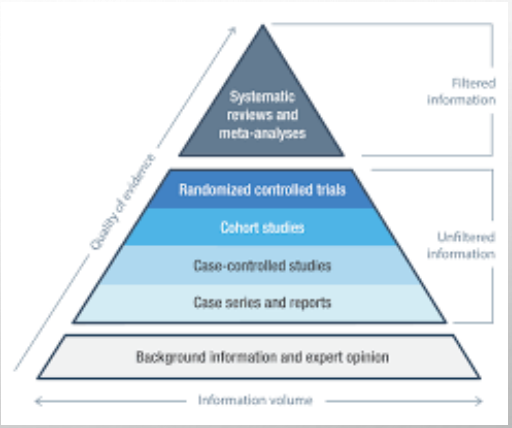
AI ANALYZES

- GAIT SPEED
- MEDICATION LIST
- PRIOR FALLS

GUIDELINES FOR CLINICIANS

USING AI RESPONSIBLY

- EVALUATE EVIDENCE
- UNDERSTAND LIMITATIONS
- MAINTAIN CLINICAL OVERSIGHT



FUTURE DIRECTIONS

EMERGING INNOVATIONS

- DIGITAL BIOMARKERS
- PERSONALIZED AI MODELS
- PREDICTIVE HEALTH SYSTEMS

KEY TAKEAWAYS

AI CAN SUPPORT AGE-FRIENDLY CARE

- EARLIER DETECTION
- PERSONALIZED CARE
- BETTER MONITORING

QUESTIONS

TECHNOLOGY SHOULD HELP OLDER ADULTS

1. AGE SAFELY
2. MAINTAIN INDEPENDENCE
3. RECEIVE BETTER CARE