



# Developing a Healthy Aging System

**Center for Health Enhancement Support Systems**

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# So Many to Thank

- Elders
- Patients
- Families
- Fiona McTavish
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- Joe Glass
- John Lee
- Jane Mahoney
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- Haile Berhe
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# Disciplines involved in Center

- Systems Engineering
- Communication Science
- Gerontology/Geriatrics
- Computer Science
- Educational Psychology
- Statistics
- Nursing
- Addiction Medicine
- Political Science
- Psychophysiology
- Neuroscience
- Social Work
- Population Health

# My Job:

Components of an ICT that achieve health?

Describe a system focused on health.

Role of mobile and sensors?

Role of analytics?



# What does a system need to get health?

Individuals, “Families”, Community.

## LONG DURATION.

*J Studies on Alcohol.* 63, 551-.

## ASSERTIVE OUTREACH.

*Addictive Behaviors.* 11, 105-.

## MONITORING (sensors).

*JAMA Psychiatry.* 71(5):566-.

## FAMILY.

*Cancer.* 119(9), 1744-.

## PROMPTS AND REMINDERS.

*IEE: Intel Transp Sys.* 153(1). 51-

## DECISION TAKING

*J Adol Subst Abuse.* 16, 69-

## REINTERPRETATION.

*Pain.* 146(1-2):205-.

## PERSON, FAMILY, CLINICIAN COMMUNICATION

*J Cardiopulm Rehab.* 23(5). 341-

## SOCIAL SUPPORT.

*J Hlth Psych.* 76, 274-.

## ANALYTICS.

*Comp & Biomed Res.* 10(2), 83-.

# Elder Tree





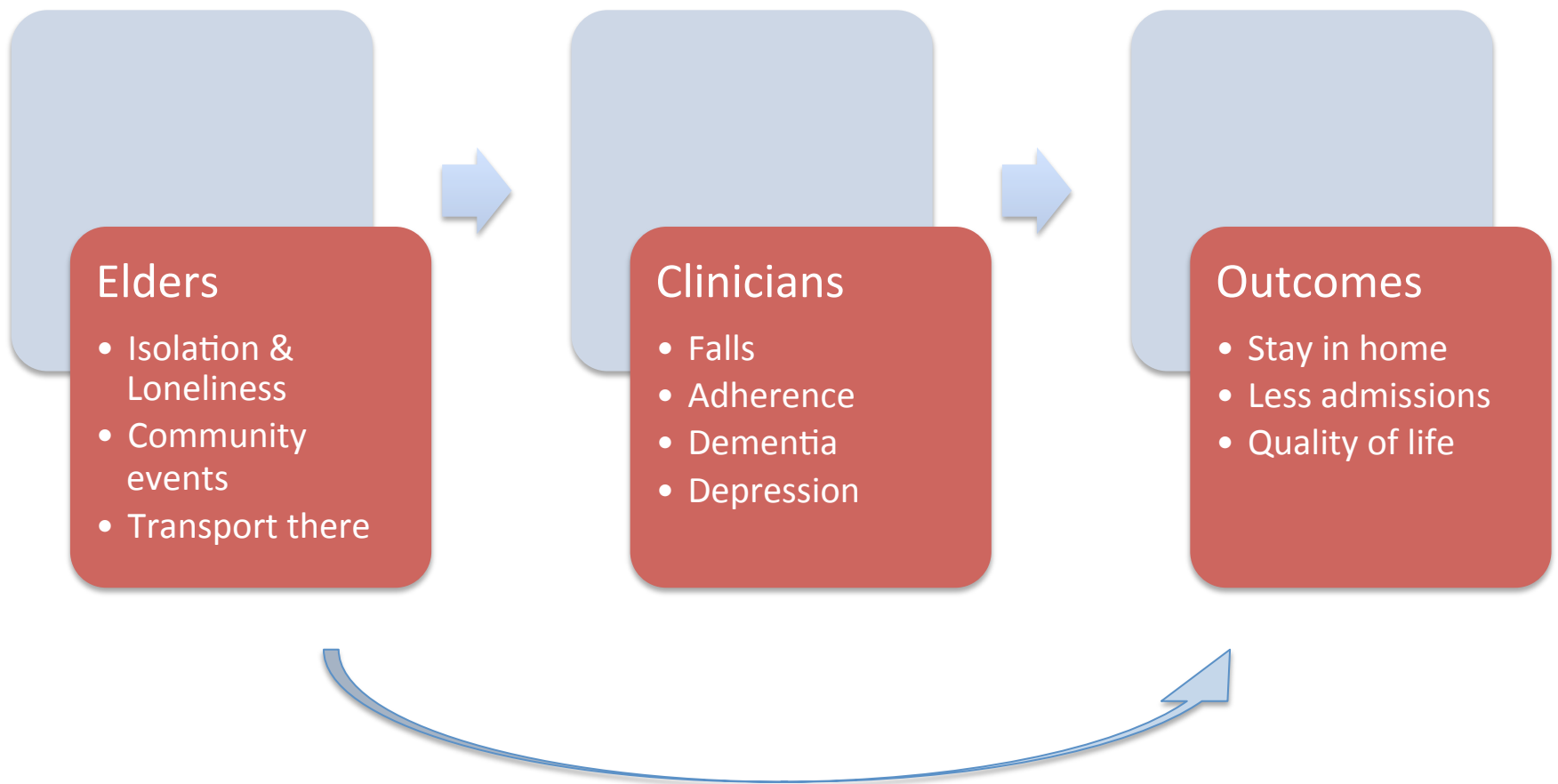
# The Customer is **Always** Right.

- Obsessively understand the customers.
  - Needs and assets.
  - Walk through
  - Time in the home
- Need support systems to build on assets and reduce needs.



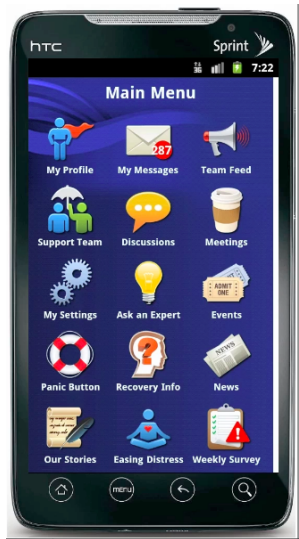


# Everyone is right

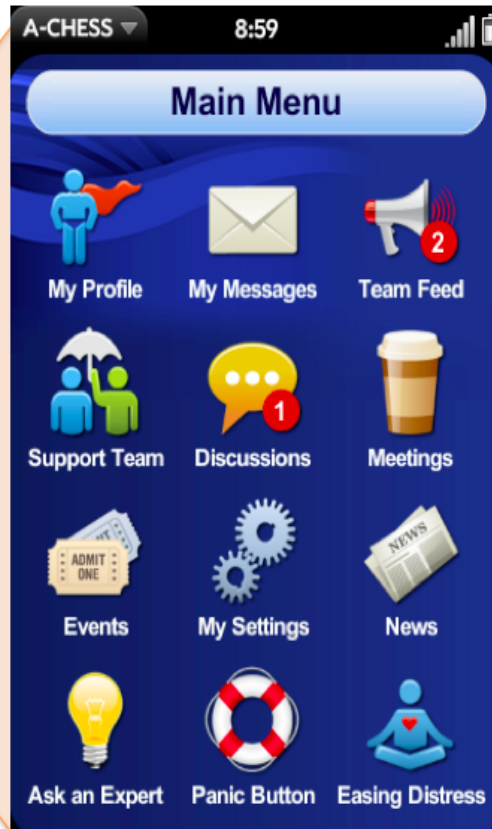


# ACHESS

ACHESS



It is operating now!



- **Social support**
  - Discussion groups
  - Live Chat & text
  - **Panic Button**
- **Virtual Counseling**
  - Assertive outreach
  - Counselor contact
  - Video conferencing
- **Education and training**
  - Games and relaxation
  - Tailored information & stories
  - Healthy event newsletter
- **Location tracking**
  - **Hi risk locator**
  - Meeting locator
- **Assessments**
  - EMA
  - Scheduled assessment
  - ACHES use
- **Alerts**
  - Reminders
  - Risk alerts
  - Clinician alerts

# Keep it simple



## Conversations



**Private  
Messages**



**Public  
Discussions**

2



**Family and  
Friends**



**Ask a Coach**

 [Back to Conversations](#)

## Discussions

Clear new message counts



Just Chatting 1 new



Health & Wellness



Milwaukee County



Preventing a Fall



Religion / Spirituality 1 new



Caregiving Support



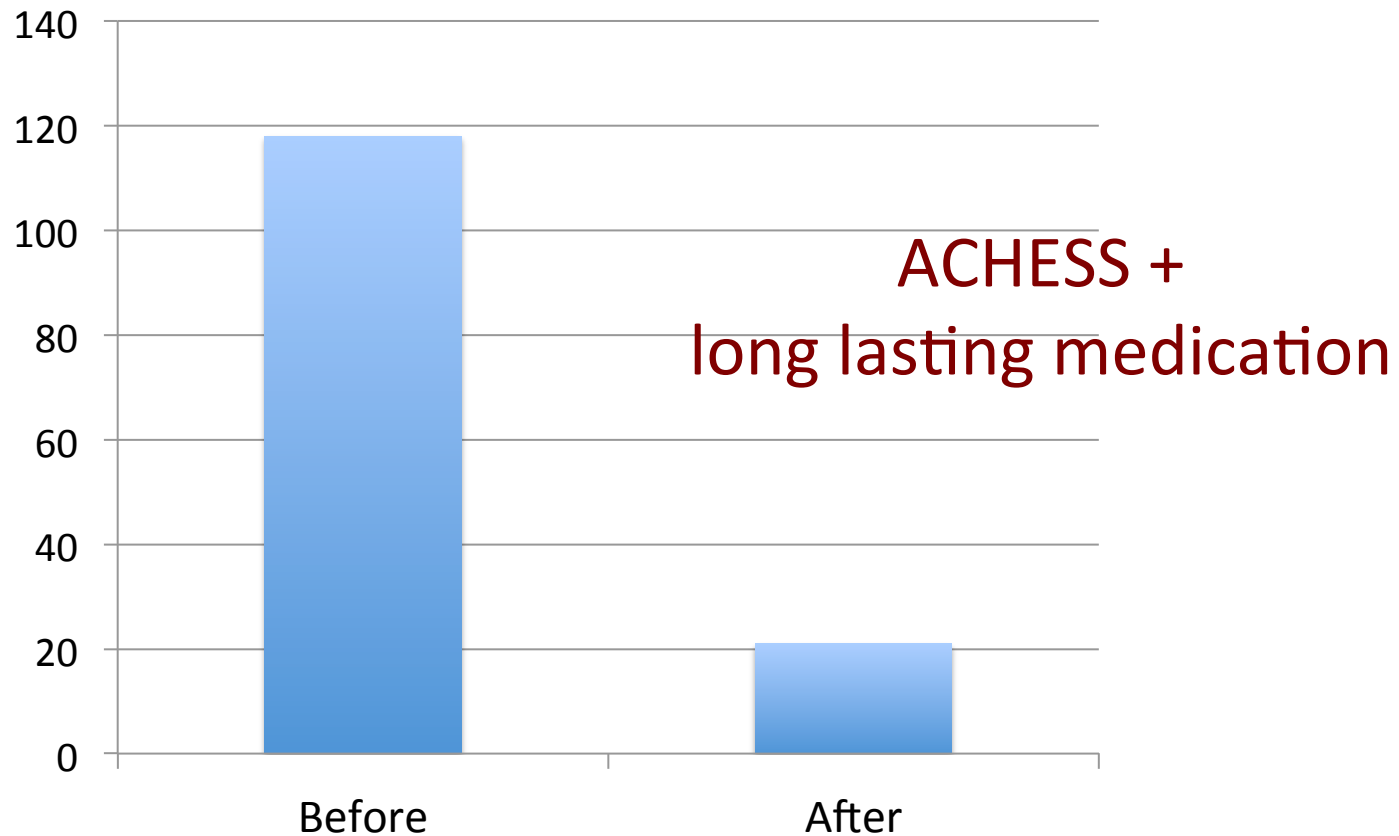
ElderTree Help



Peace Tuesday Bible Study  
Group

# Technology can't do it alone

18 months before & 18 months after the bundle started



# Role of mobile and sensors

The surface is just scratched.

We are using:

ACCELEROMETERS.

CAMERA

GPS (video).

But:

**BE CAREFUL OF SPYING**

**Avoid the mice!**



# Role of analytics

Approaches (Behavioral Economics, Machine Learning,  
Stochastic optimization)

Machine learning: becoming practical with big data.  
(CHESS collects every key stroke).  
Tremendous potential.

**AND**

Subjective Bayesian decision models also work.  
1973 computer interview; Bayesian predictor re suicide risk.  
Better than clinicians.

Both are learning systems.

*Computers & Biomedical Research (1977), 10(2), 83-  
(+ 14 other articles).*

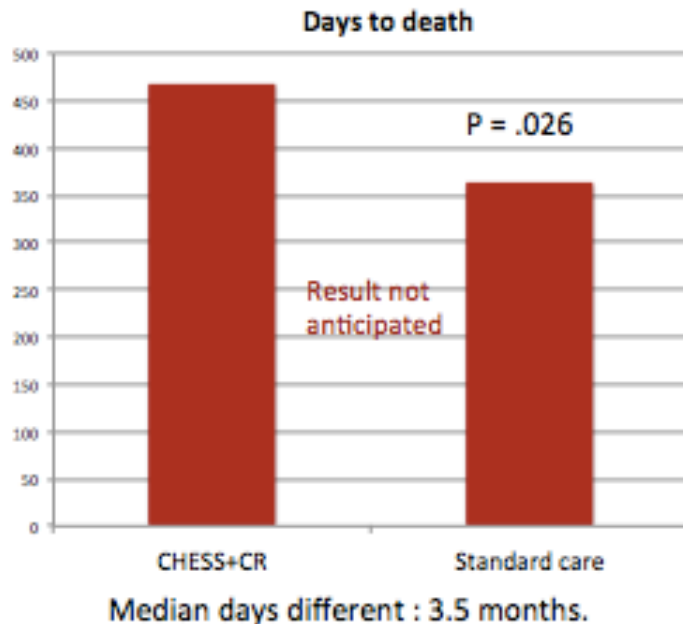


# That's all folks!



# Monitoring and Feedback

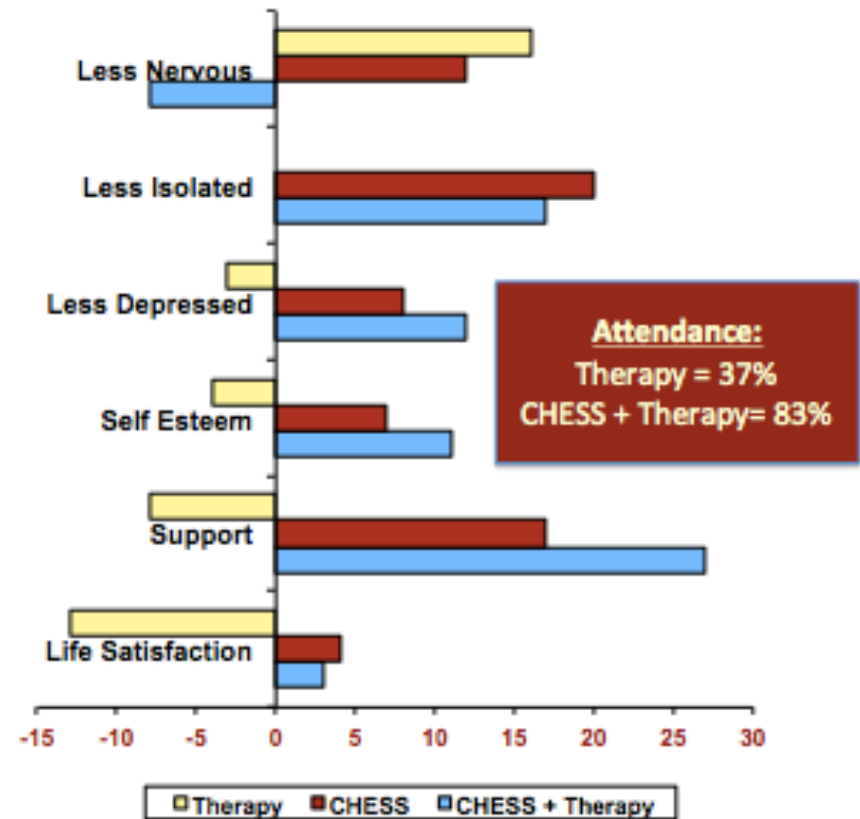
## Lung Cancer Survival: CHESS patients lived 35% longer.



Gustafson D, et al (2013). *Cancer* 119(9), 1744-  
Copyright; CHESS University of Wisconsin  
Madison 2013

Gustafson et al. (2012). *Journal of Addiction Medicine*, 6(1), 24-28.

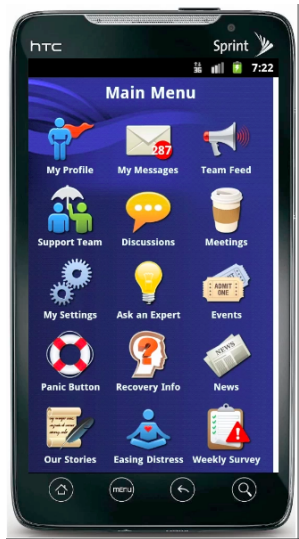
## Adult Children of Alcoholics Group Psychotherapy vs CHESS



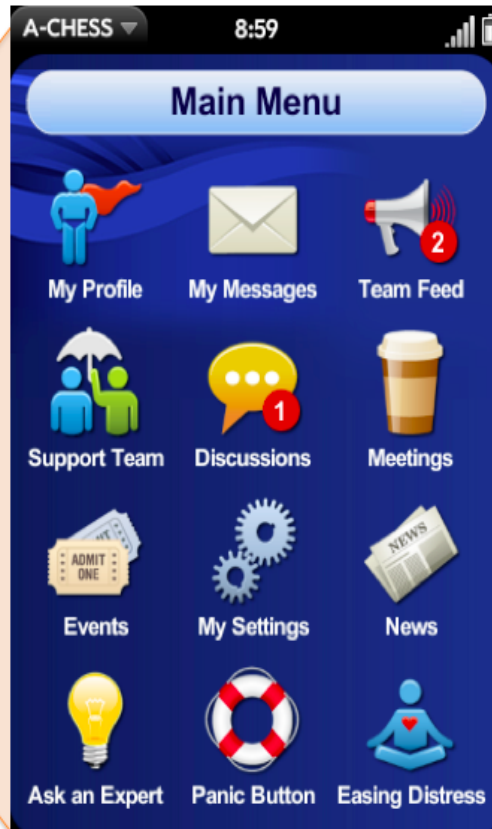
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  - Clinician alerts✕

## Personal



**My To-do List**



**My Health  
Tracker**



**My Bookmarks**



**My Services**

## Information



**Local  
Resources**



**Bulletin Board**



**Active Living  
Tips**



**Map your Trip**

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