Healing the patient by supporting the person.
Leadership Team
Technical, medical, gerontological & business expertise

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The Root Problem

**ROOT CAUSE:** Insufficient workforce to provide personal attention & support for frail, elderly patients

**DELIRIUM CAUSES FALLS**
Afflicts >29% of older inpatients, costs >$16,000 each time

**FALLS**
All falls considered preventable – Medicare won’t pay hospital

**TYPICAL HOSPITAL PAYS $1,600,000/yr**
Much higher rate of falls for elderly, costs >$14,000 per injury

**TYPICAL HOSPITAL FINED $200,000 IN 2016 FOR READMISSIONS**
20% chance of 30-day readmission, costs $13,000 each

**AVOIDABLE CARE UTILIZATION**
Reduces profits from shared savings contracts (e.g. bundled payments & accountable care organizations)

**Hospital Inpatient**

**Delirium**

**Falls**

**Post-discharge & In-Home**

**Poor Adherence & Self-management of Multiple Chronic Conditions**
Our Solution
Personal support to drive key health outcomes

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**Benefits**

- ↓ falls
- ↓ delirium
- ↓ readmissions
- ↓ avoidable care utilization
- ↑ value-based care $$$
- ↑ self-management
- ↑ patient satisfaction
- ↑ wellness

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*Fully HIPAA compliant. Data is 256-bit AES encrypted at rest and in transit.*
Health Advocate Qualifications

Only 1% of applicants pass all our screening criteria

Minimum health advocate training: 7 certifications

- **care.coach** Psychometric, Technical & Skills-Based Screening
- **Partners HealthCare** Basic Motivational Interviewing
- **Cleveland Clinic** Cognitive Disorders & Delirium Evaluation
- **Alzheimer’s Association** Dementia Care (essentiALZ®)
- **National Institutes of Health** Privacy & Ethics Training
- **InfoCubic** (BSCC + ISO cert.) International Background Check
- **care.coach** Patient Support, Security & Job Shadowing Training
Clinical Algorithms & Automation

Evidence-based protocols for multi-morbidity

1. Heart Failure
2. Myocardial Infarction
3. Pneumonia
4. COPD
5. Knee/Hip Replacement
6. Diabetes
7. Hypertension
8. Depression
9. Falls
10. Delirium

Hospital Readmissions Reduction Program
Patient Support Avatar
Combining the best of human + software

Did you weigh yourself today?
Great! What did the scale read?

ALERT: water weight

example clinical algorithm: heart failure

voice interaction works with even the most high risk, high cost patients with limited cognitive & tech abilities

audio/video

text-to-speech

human control

data

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avatar interaction example
Actionable Data & Reports
Via Provider Portal, Family Portal & Phone/Email

Integrate with clinical workflow
Maximize care management resources

Leverage family & informal care team
Maximize patient activation

Provider Portal
Pt weight ↑ 7 lbs

Family Portal
Mary says hi!

Care Journal
Show the log for the last 10 entries
Time zone: Pacific Time
8/18/2016 1:57 PM
Victor petted me and said hello. He introduced me to Jennie and she told me that she is from San Francisco. I told her that I was born at MIT in Boston and she continued talking to Victor.
Validation
Both inpatient & community-based clinical studies

Study at Jamaica Hospital, NY, conducted by Wexler S & Drury L. Pace University. 2016. See Appendix B.

Three other clinical studies show psychosocial benefits & health coaching potential in the community & post-discharge
Solution Landscape

care.coach is uniquely high tech + high touch

CARE + CLINICAL VALUE

EASE OF ADOPTION
(LOW COST & COMPLEXITY TO PROVIDER)
Design for All

Multiple avatar options

**Immersive Avatar**

Locked into avatar app, regular interface hidden.

Optimal experience for elderly patients who may not be comfortable with tech or who have cognitive challenges. Zero learning curve.

Specialized hardware supplied by care.coach.

**Free-floating Avatar**

Persistent across regular mobile experience.

Optimal experience for patients who are tech-savvy or already have an Android device.

Can be deployed on patients’ own Android devices or via hardware platform partners.
Case Study: Jamaica Hospital
Inpatient delirium & falls mitigation

Highly challenging patient population

*Diverse, low income/education, average age = 77*

Limited EHR capabilities & clinical support

*Hospital quality is rated 1-star by CMS*

95-patient clinical study: care.coach reduced falls, delirium, loneliness, and restraint use
Delirium Statistics
Massively under-recognized problem

Delirium occurrence rates for older persons in the hospital setting range from 29-64%.

- Postoperative: 12-51%
- Intensive care: 19-82%
- Nursing home: 20-56%
- Palliative care: 47%
- Stroke units: 27%
- Emergency room: 8-17%

But, delirium is only recognized by:
- About 1/3 of physicians
- About 1/3 of nurses

Adverse outcomes with delirium

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Adjusted Relative Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prolonged length of stay</td>
<td>1.4-2.1</td>
</tr>
<tr>
<td>Mortality</td>
<td>1.5-1.6</td>
</tr>
<tr>
<td>Institutionalization</td>
<td>2.5</td>
</tr>
<tr>
<td>Functional decline</td>
<td>1.5</td>
</tr>
<tr>
<td>Cognitive decline/Dementia</td>
<td>6.4-41.2</td>
</tr>
</tbody>
</table>

- Hospital costs (> $11 billion/yr)
- Post-hospital costs (> $153 billion/yr)
  - Rehospitalization
  - Emergency department visits
  - Institutionalization
  - Etc.

Delirium is preventable
30-40% of delirium is preventable through multicomponent targeted interventions.

Citation: Inouye SK, Westendorp RGJ, Saczynski JS. Delirium in elderly people. The Lancet 2014;383:911-22.
Delirium & Falls

Delirium is a major cause of inpatient falls

**COST SAVINGS NOTE** (ref CTH)

The average inpatient fall with injury increases LOS 6.3 days & costs the hospital $14,056.

With care.coach, a single 30-bed unit could reduce fall costs by $100,000/year.
Case Study: Jamaica Hospital

care.coach intervention reduced fall rate by 70-85%

Fall Rates by Hospital Unit & Time Period

National rate = 3.56 falls / 1000 patient days

care.coach rate = 0.9 falls / 1000 patient days

Case Study: Jamaica Hospital
Reductions in delirium, loneliness & restraint use

Greater Improvement in Average Delirium Score for Intervention Patients vs Control Patients (p=0.003)

Loneliness
Greater improvement in average loneliness score for intervention patients vs control patients (p=0.008)

Restraints
4 intervention patients were restrained upon admission.
In all 4 cases, restraints were discontinued within 2 hours of care.coach initiation.

Study data from Wexler S & Drury L. Pace University. 2016.
Sanford Chamberlain: Background
Post-acute, hospital readmission prevention

Non-compliant rural Native American population with heart failure and diabetes

<3 months from initial contact to contract, deployment & ROI from prevented readmission
ROI from Avoiding Readmission
De-identified patient data shown

Email + phone alert triggered by contextual response:

**Prevented Readmission**

*$13,000 cost avoidance*
by informing clinical team to adjust medications

<table>
<thead>
<tr>
<th>Record Id</th>
<th>Customer Name</th>
<th>Customer Timezone</th>
<th>Scheduled Time</th>
<th>Task Name</th>
<th>Question</th>
<th>Answer</th>
<th>Answer Time</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>512</td>
<td>sanford03</td>
<td>America/Chicago</td>
<td>2015-02-24 17:00:00</td>
<td>CORE-HFPD01ab</td>
<td>Have you felt any shortness of breath or difficulty breathing lately? No</td>
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<td></td>
<td>2015-03-24 13:01:13</td>
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</table>
Health Advocate Journal Entry
03/25/2015-11:55

I woke up and saw PATIENT. I greeted her good morning. She was taking her medications. I asked her a few questions and she was able to answer them. She said she slept well last night. She told me she feels like quitting the cardiac rehab program but that she doesn't want them to take me away from her. I encouraged her to continue the program and that I will be with her to support her. She said thank you. She said it was hard to do everything on her own, like cooking and preparing her meals. I agreed with her it was difficult but we will get through it in the end.

Psychosocial support and patient relationship from care.coach enables improved adherence and clinical outcomes.
Chronic Condition Statistics

Older patients w/ multiple conditions → 71% of spending

Percent of All Americans with Multiple Chronic Conditions, by Age Group – 2010

Total U.S. Healthcare Spending by Number of Chronic Conditions in 2010

Multiple Chronic Conditions Chartbook: 2010 MEPS Data
**Why Now?**

Critical for shift to value-based care

**FACTS:**
- 50% of Medicare payments will be value-based by 2018
- Hospitals must shift from having only a provider mindset to being the payer
- Discharging patients to skilled care will cost hospitals $$$ and quality ratings

<table>
<thead>
<tr>
<th></th>
<th>Home Care</th>
<th>Assisted Living</th>
<th>Transitional Care Visit</th>
<th>Chronic Care Man.</th>
<th>Home Health</th>
<th>Hospice Palliative</th>
<th>SNF</th>
<th>Acute Rehab</th>
<th>LTACH</th>
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</thead>
<tbody>
<tr>
<td><strong>Financial &amp; Quality</strong></td>
<td>None</td>
<td>None</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Nominal</td>
<td>None</td>
<td>Moderate</td>
<td>Severe</td>
<td>Severe</td>
</tr>
<tr>
<td><strong>Penalty to Discharging</strong></td>
<td>None</td>
<td>None</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**QUESTION:**
How can hospitals cost-effectively enable patients to successfully self-manage?

**ANSWER:**
care.coach – the only tech-enabled solution effective with high-risk elderly
Case Study: Older Adults with MCI
Community-based support for cognitively impaired

Elderly population living independently
10 women, average age 78.3 years (range 68-89)
Generally, mild cognitive impairment
Average MoCA 21.9 pre-intervention, +0.13 with care.coach

# Case Study: Older Adults with MCI

## Improved Social Support & Depressive Symptoms

<table>
<thead>
<tr>
<th>Measure (Tool)</th>
<th>Pre-Test Avg (n=10)</th>
<th>Post-Test Avg (n=8)</th>
<th>Average individual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Support (MOS SSS)</td>
<td>69.9</td>
<td>72.6</td>
<td>+1.36</td>
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<tr>
<td>Subscale</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Emotional/Informational</td>
<td>65.6</td>
<td>69.5</td>
<td>+1.17</td>
</tr>
<tr>
<td>Tangible</td>
<td>72.5</td>
<td>71.1</td>
<td></td>
</tr>
<tr>
<td>Affectionate</td>
<td>65.0</td>
<td>67.7</td>
<td>+2.08</td>
</tr>
<tr>
<td>Positive social interaction</td>
<td>66.7</td>
<td>77.1</td>
<td>+6.25</td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHQ-9</td>
<td>3.5</td>
<td>2.5</td>
<td>-.88</td>
</tr>
</tbody>
</table>

“participants talked about having a remote friend who is always available and ready to talk when one is lonely, the significance of the reminders that the digital companion would provide (for medication adherence or dietary restrictions) and the ease of mind that a remote friend provides”
### Case Study: Older Adults with MCI

#### Example Transcripts (1 of 2)


<table>
<thead>
<tr>
<th>Humor</th>
<th>Sharing in laughing and amusement</th>
<th>Participant: “You don't know what I just did, that was funny. I responded in that same automated way. I sort of started to talk like that myself. That was very funny.” Avatar: “Haha!”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hobbies and personal goals</td>
<td>Hobbies and aspirations</td>
<td>Participant: “I’m going to go to the ukulele group. I have a ukulele but I haven’t played it in a while.” Avatar: “Can you play?” Participant: “I used to. I’d like to get back to it. I haven’t been practicing.” Avatar: “I’d love to hear you play.”</td>
</tr>
<tr>
<td>Travel</td>
<td>Speaking about places he/she has gone or plans to go</td>
<td>Avatar: “I thought you were going on a cruise to Japan?” Participant: “I am, but not until August. The 27th of August.” Avatar: “Oh I see. I thought for May…..” Participant: “I wouldn't leave you.”</td>
</tr>
</tbody>
</table>
### Case Study: Older Adults with MCI

#### Example Transcripts (2 of 2)


| Story-Telling | A recollection of a real previous experience or event | Avatar: “Where?”
|---------------|------------------------------------------------------| Participant: “When I was in Oklahoma.”
|               |                                                      | Avatar: “Oh so you came from Oklahoma?”
|               |                                                      | Participant: “I came from Arkansas, that’s where I was born. But I lived in Oklahoma, California and Alaska before I moved to Seattle. I’ve lived here for almost 60 years, I like it very much.”

#### Discussion of Emotional State

| Happiness | The state of feeling elated and content | Participant: “That makes me super happy. That's the best. That's the very best. That makes me happy.”
| Sadness | Feeling unhappy | Participant: “I don’t like that to happen. That makes me sad. I don’t like that.”
| Helpless | Feeling powerless and incapable | Participant: “Having two adult children that have lots of difficulties and it overwhelms me and with Dr. M being gone, I don’t have a safe place to help me and this has been a really hard week. It wears me out. That’s what’s wrong.”
| Comfort | Not having feelings of stress or pain | Participant: “I'm so glad it's you. That makes me feel comforted.”
| Love | Expressing affection for each other | Avatar: “I love you.”
|       |                                      | Participant: “I love you too, oh my goodness!”

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