Validation of a Patient-Centered Digital Tele-Health Tool

Sheryl Flynn PT, PhD
Co-Founder/CEO

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Health

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- Non-Financial: Dr. Flynn is the co-founder and CEO of Blue Marble Health and has received government grants/contracts to develop the products described.

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Learning Objectives

Following this course, learners will be able to:
- Evaluate a Patient-Centered Digital Tele-Health Tool.
- Describe implementation protocol options for a variety of settings.
- Describe data and reports for program evaluation.

Time	Topic	Instructional Method
0-5 min	Introduction	Lecture
10	Platform	Lecture/Demo-Video of platform
15 min	Validation Outcomes	Lecture
10	Reporting Functionality	Lecture
10	Implementation	Lecture
5	Summary/Q&A	

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Blue Marble Team

People with disabilities
Clinicians
Administrators
Content Experts
- Chris Ashford
- Kevin McLaughlin
- Nina Withrington, PT, DPT
- Robin Johnson, PhD
- Bonnie Kennedy, OTR/L, PhD
- William Hoffmann
- Jamie Antoniesse
- Joe France
- David Mershon
- Andrew Neff
- Paul DuPre
- Jacob Back
- Cindy Liu
- David Woo
- Brandy Grant
- Dario Padilla
- Justin Proffitt
- Rachel Proffitt, OTR/L, OTD
- Interns

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Plan

1. Evaluate a Patient-Centered Digital Tele-Health Tool.

2. Describe implementation protocol options for a variety of settings.

3. Describe data and reports for program evaluation.

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Plan

1. Evaluate a Patient-Centered Digital Tele-Health Tool.

2. Describe implementation protocol options for a variety of settings.

3. Describe data and reports for program evaluation.

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Challenges and Opportunities

Challenges

- Lack of standardization
- Massive Need- Poor Access
  - Paper based home programs
  - Vestibular
    - Retinal slip
- Travel inconvenience
- Weather
- Distance
- Equitable Distribution of Care
- High Cost

Opportunities

- Standardized assessment
- Ability to track adherence
- Remote monitoring
- Anytime/Anywhere access
- Work flow
- Flexibility in system- Personalized care
- HIPAA compliant- double encryption
- Equitable Distribution of Care
- Near time data
- Population Data Reports
- Self-monitoring
- Integrates with EHR
- Screening

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Blue Marble Platform

Cognitive
- Assessment
- Intervention

Physical
- Assessment
- Intervention

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Blue Marble Health Platform

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Step 1- Create a Routine

Routine 1	Routine 2
Self-Assessments	Self-Assessments
Exercise 3d/wk/1mo	Exercise 3d/wk/1mo
Go To Routine 1	Repeat

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Step 2- Client performs the routine

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Step 3. The Administrator Tracks Performance

Step 4. The Administrator Updates the Routines and plan based on client's performance

Routine 3	Routine 4
Self-Assessments	Self-Assessments
Exercise 3d/wk/1mo	Exercise 3d/wk/1mo
Go To Routine 4	Repeat

Step 5. The Administrator continues to track the client over time

Step 5. The Client creates self-reports to see progress (digital or paper)

	Initial	Today
Dates	Jan 17, 2017	April 14, 2017
FRQ	6	4
ABC	75%	85%
DHI	20	30
Dizziness VAS	5	3
30 Sec Sit to Stand	6	11

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Step 6. The Administrator keeps track of many clients at the same time.

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Step 7. The Administrator creates population reports.

	Period 1	Period 2
Dates	Last Month	This Month
Users	100	150
Adherence	3hr/wk	3.2hr/wk
Data 1	100%	95%
Data 2	25	16
Data 3	Yes	No

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Blue Marble Platform
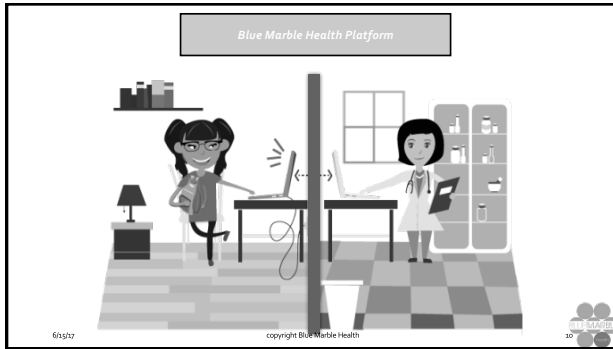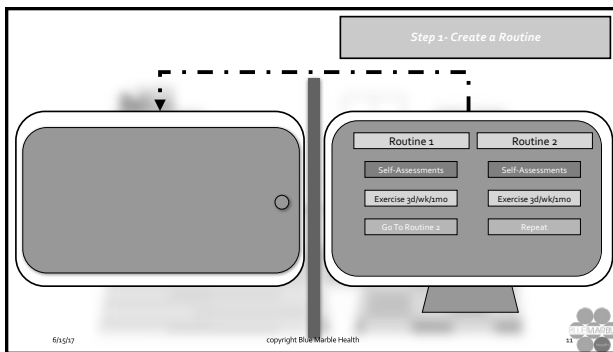
Cognitive
- Assessment
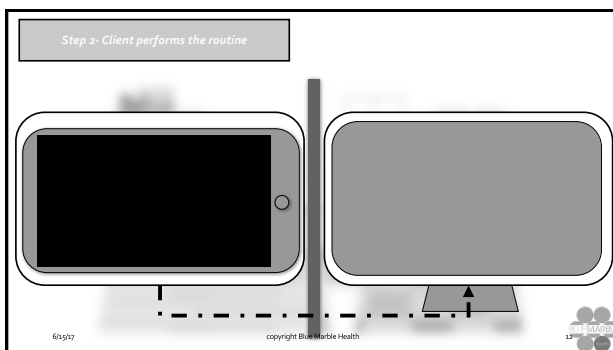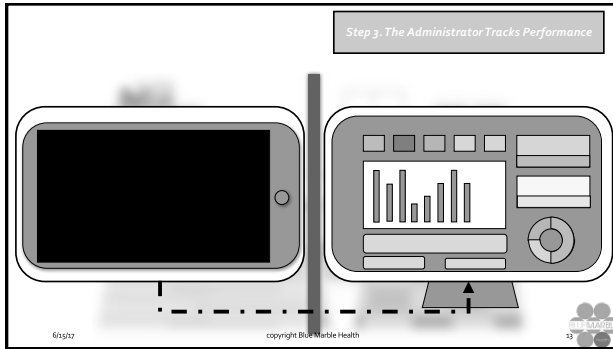- Intervention

Physical
- Assessment
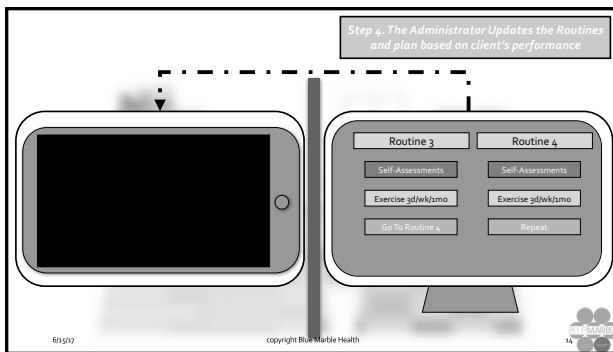- Intervention

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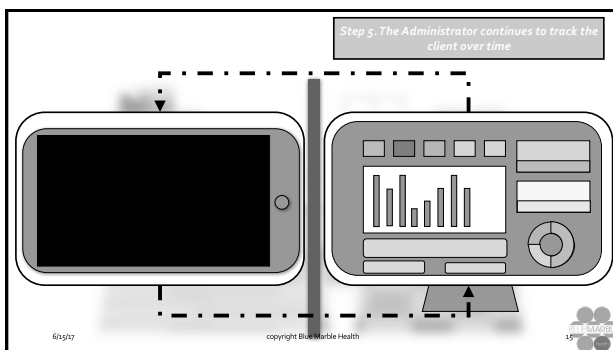## Blue Marble Platform

Cognitive
- Attention
- Memory
- Visual Processing
- Executive Function
- Perceptual Motor Skills

Physical
- Balance
- Coordination
- Strength
- Depression
- Dizziness

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Blue Marble Platform

Cognitive
- Selective Attention
- Divided Attention
- Visual Spatial Attention
- Processing Speed
- Organization
- Impulse Control
- Working Memory

Physical
- Balance
- Coordination
- Strength
- Depression
- Dizziness

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Blue Marble Platform- Assessments

Cognitive
- Trails
- Go/No-Go
- Digit Symbol
- Line Crossing
- Patient Reported Outcomes NIH PROMIS
- Visual Perception
- Two Choice
- Card Sort

Physical
- Fall Risk Questionnaire
- Depression Screen
- One Legged Stand Test
- 30 Sec Sit to Stand Test
- Timed Up and Go*
- Stair Climb Test*
- 7 Vestibular Tests*

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Blue Marble Platform- Exercises

Cognitive
- Activities that challenge
- Attention
- Memory
- Visual Perception
- Executive Function

Physical
- Otago Exercise Program
- Tai Chi
- VOR x 1*
- VOR x2*
- Arthritis- CJR* (pre/rehab)

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Assessment Selection Screen

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Assessment Selection Screen

Select the Types of Tests to Take.

Help

☐ Falls Risk Tests ☐ Dizziness Tests

☐ Arthritis Tests

Main Menu   Advanced

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Select Tests

Help   Type test name here to search

☐ ABC: Activities-specific Balance Confidence Scale   ABC

☐ DHI: Dizziness Handicap Inventory   DHI

☐ 30STST: 30 Second Sit to Stand

Main Menu   Back

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In-app Results Screen

Your Results

Help

Test	Goal	Your Score	Your Result	
Fall Risk Questionnaire (points)	0-3	9	Higher Fall Risk	
Depression Screen (points)	0-1	0	Low Depression Risk	
Disability Rating Scale - V (points)	0-1	N/A	Skipped	
Balance Confidence Scale	80%+	34%	Moderate Confidence	
Left Leg Stand (seconds)	15 +	24	Typical Fall Risk	
Disequilibrium VAS (points)	0	5.3	Moderate Unsteadiness	

Next

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In-app Progress Graph

Your Results

Balance Confidence Scale

(graph showing Percent Confidence vs dates 4/13, 4/14, 4/15, 4/15, 4/18, 4/25, 5/13, with scale 0%, 67%, 80%, 100%)

Back

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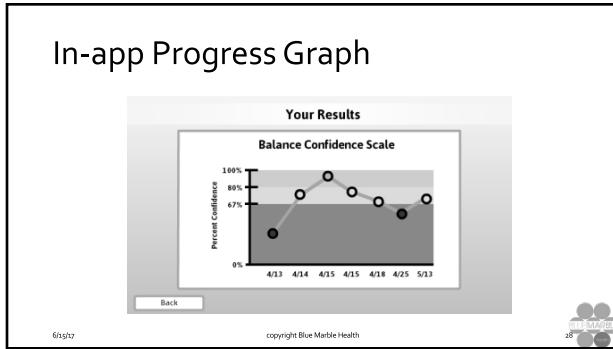
Blue Marble Platform

Cognitive
- Concussion
- Aging
- Stroke
- MS
- PD
- Etc.

Physical
- Aging
- Fall Risk
- Dizziness
- COPD
- Arthritis
- Etc.

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The Blue Marble Platform

- Video here

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Product Validation

Usability

Efficacy   Reliability

Validity

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Blue Marble Platform- Validation

U

Usability

- The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use (usabilitynet.org).
- **Effectiveness**- can users complete the tasks, achieve the goals
- **Efficiency**- how much effort do users require to do this? (measured in time)
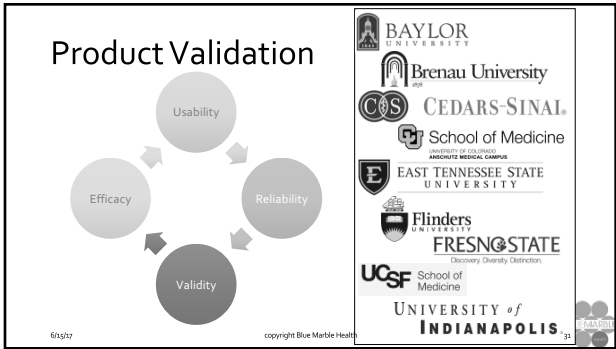- **Satisfaction**- what do users think about the products ease of use?
  - All are affected by the user, their goals and the situation

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Blue Marble Platform- Validation

R

Reliability

- Consistency and repeatability

V

Validity

- Does the instrument measure what it is supposed to measure?

E

Efficacy

- Does the intervention have an effect in a controlled setting?
- Effectiveness- does the intervention have an effect in the real world?

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Slide 34: Usability

Cognitive
- Assessments- 76th%ile
- Intervention- 79th%ile

Physical
- Assessments- 69th%ile
- Intervention- 69th%ile

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Slide 35: Reliability

Cognitive
- Range- r=.61-.89 (p<.01)

Physical
- Range- r=.67-.90 (p<.01)

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Slide 36: Validity

Cognitive
- **Younger-**
  - range r=.70-.81 (p<.01)
- **Older-**
  - range r=.45-.81 (p<.01)

Physical
- Older-
  - ICC ranged from .582-.90 (p<.05 and .01)

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Efficacy

Cognitive
- Effect size- Cohen's D- .432

Physical
- Not inferior
- Less pain

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Meaningfulness

Cognitive
- Adherence- better than paper

Physical
- Adherence- not different from paper

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Meaningfulness

Cognitive
- Sensitive to aging

Physical
- Reduced fall risk

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Importance

Overall Fall Risk

Number of Participants

35
30
25
20
15
10
5
0

■ Expected Risk
■ Higher Fall Risk

7

Start   End

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Validation Research

- Usability- *the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use* (usabilitynet.org).
  - *Effectiveness- can users complete the tasks, achieve the goals*
  - *Efficiency- how much effort do users require to do this? (measured in time)*
  - *Satisfaction- what do users think about the products ease of use?*
    - *All are affected by the user, their goals and the situation*
- Reliability- consistency and repeatability
- Validity- does the instrument measure what it is supposed to measure?
- Efficacy- does the intervention have an effect in a controlled setting?
  - Effectiveness- does the intervention have an effect in the real world?

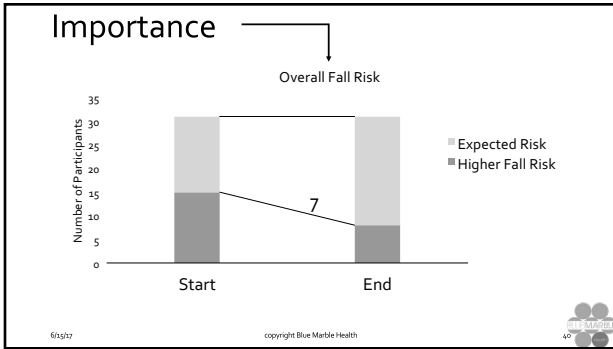6/15/17   copyright Blue Marble Health   41

Rock Steady©

- Purpose- To develop a mobile self/clinic-based assessment and exercise tool for adults with vestibular impairment

- Integrate Assessments and Exercises related to vestibular rehabilitation

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Assessments

- Activity-Specific Balance Confidence Inventory
- Disability Rating Scale-Vestibular
- Dizziness Handicap Inventory
- Dizziness Interference
- Dizziness Visual Analog Scale
- Oscillopsia Visual Analog Scale
- Disequilibrium Visual Analog Scale

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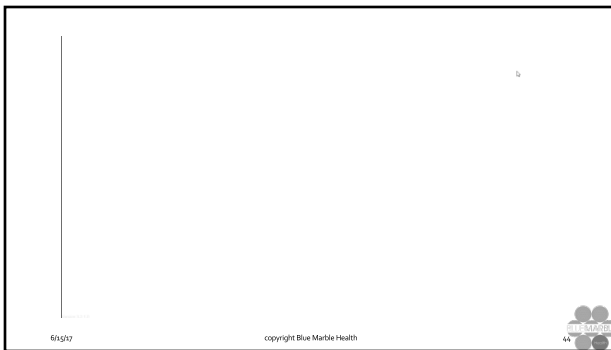
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Exercises

- VOR x 1
- VOR x 2

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Plan

1. The learner will evaluate a Patient-Centered Digital Tele-Health Tool

2. The learner will describe implementation protocol options for a variety of settings

3. The learner will describe data and reports for program evaluation

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Based on what you have seen, what value does this platform bring?

- Audience response

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What value does this platform bring?

- It depends….
  - Work flow efficiency
  - Adherence
  - Population Health
  - Documentation
  - Standardized Clinical Outcomes

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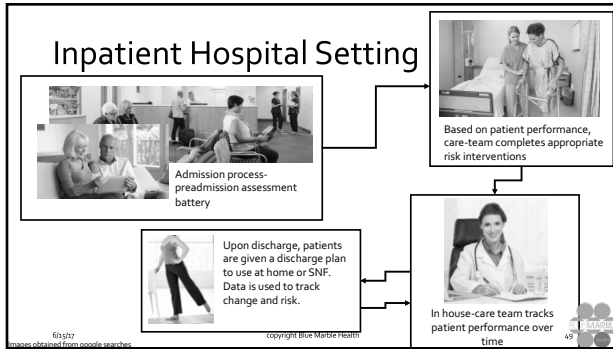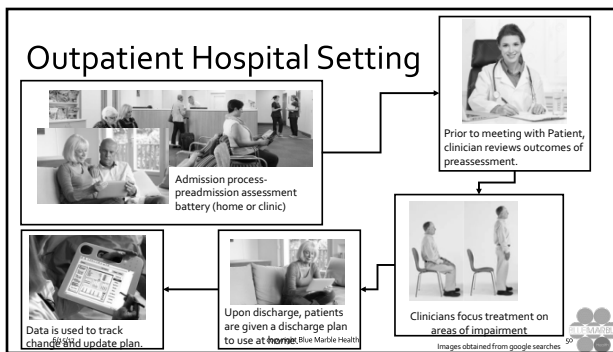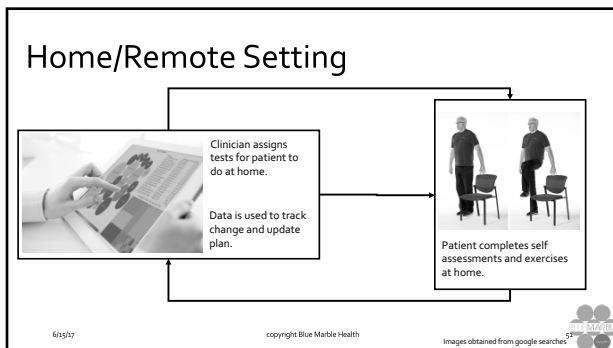## Inpatient Hospital Setting

Admission process- preadmission assessment battery

Based on patient performance, care-team completes appropriate risk interventions

Upon discharge, patients are given a discharge plan to use at home or SNF. Data is used to track change and risk.

In house-care team tracks patient performance over time

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Images obtained from google searches

Outpatient Hospital Setting

Admission process- preadmission assessment battery (home or clinic)

Prior to meeting with Patient, clinician reviews outcomes of preassessment.

Clinicians focus treatment on areas of impairment

Upon discharge, patients are given a discharge plan to use at home.

Data is used to track change and update plan.

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Home/Remote Setting

Clinician assigns tests for patient to do at home.

Data is used to track change and update plan.

Patient completes self assessments and exercises at home.

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17

Senior Center

Senior Center Use Case

- Senior Center: 18,000 seniors/year
- Sponsors 3 Matter of Balance classes/year
  - 45 seniors @ $6k/year
- 2 month Pilot of Health in Motion
  - 13 users
  - 3-5 hours of exercise/user/month
- Late 2017
  - HiM part of "meals of wheels" program
  - Launch cognitive assessments
  - Goal: reach 10,000 seniors

Plan

1. The learner will evaluate a Patient-Centered Digital Tele-Health Tool

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Admin Dashboard- view status of all patients at the same time. Sort to see most impaired patients in top positions.

Population Report- obtain population data for individualized periods of time.
Useful for annual, semiannual reporting requirements.

Individual User data dashboard- view status of a single patients to determine progress, change over time, adherence and consistency.

Prevent a Million Falls

We built Health in Motion with funding from the National Institutes on Aging. Our goal is to give back to our communities by preventing 1,000,000 falls.

We cannot do this alone? Will you help us?

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Thank you!

For Research – we are seeking research partnerships
    Sheryl Flynn: sheryl@bluemarblehealthco.com

For Pilots – we are seeking implementation pilots with VA facilities
    Chris Ashford: chris@bluemarblehealthco.com

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