

How Wearables and an App Enable Injured Workers

Recovery at-home or on-the-go.
Anytime, anywhere

Raja Sundaram | raja@plethy.com

How Wearables and an App Enable Injured Workers

Learning Objectives

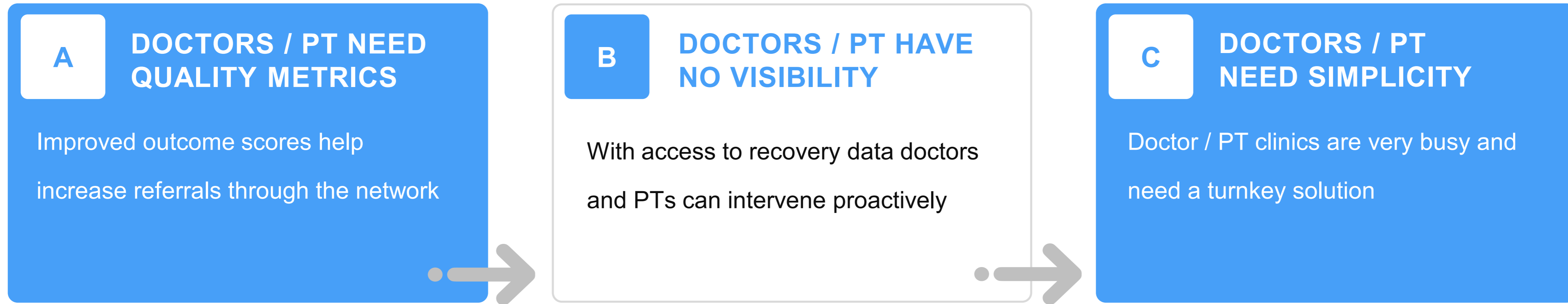
1. Discover new methods of capturing and driving injured worker engagement to achieve optimal outcomes through a bio-psycho-social approach to meet today's injured worker recovery challenges, while providing necessary insights critical for speeding up recovery and return to work.
2. Examine musculoskeletal care and associate how the right tools can empower injured workers by giving them the necessary motivation for managing their musculoskeletal health.
3. Observe and evaluate the role of digital health tools that cover the care continuum from acute to chronic conditions and how they can facilitate injured worker recovery.
4. Identify at-risk employees and facilitate the delivery of the right services at the right time.
5. Discover how digital health can keep the injured worker engaged, and how the resulting data provided by the technology can be key to a healthier quicker return-to-work and sustainable cost reductions.
6. Examine how real-time data can be used to ensure the right care is being provided at the right time, prevent ER visits, detect changes before a more serious consequence occurs, improve medical efficiency, and reduce unnecessary costs.

Care is transitioning to the home. Injured workers need to follow care program at home.

Injured workers face several barriers to recovery. Increasing care costs



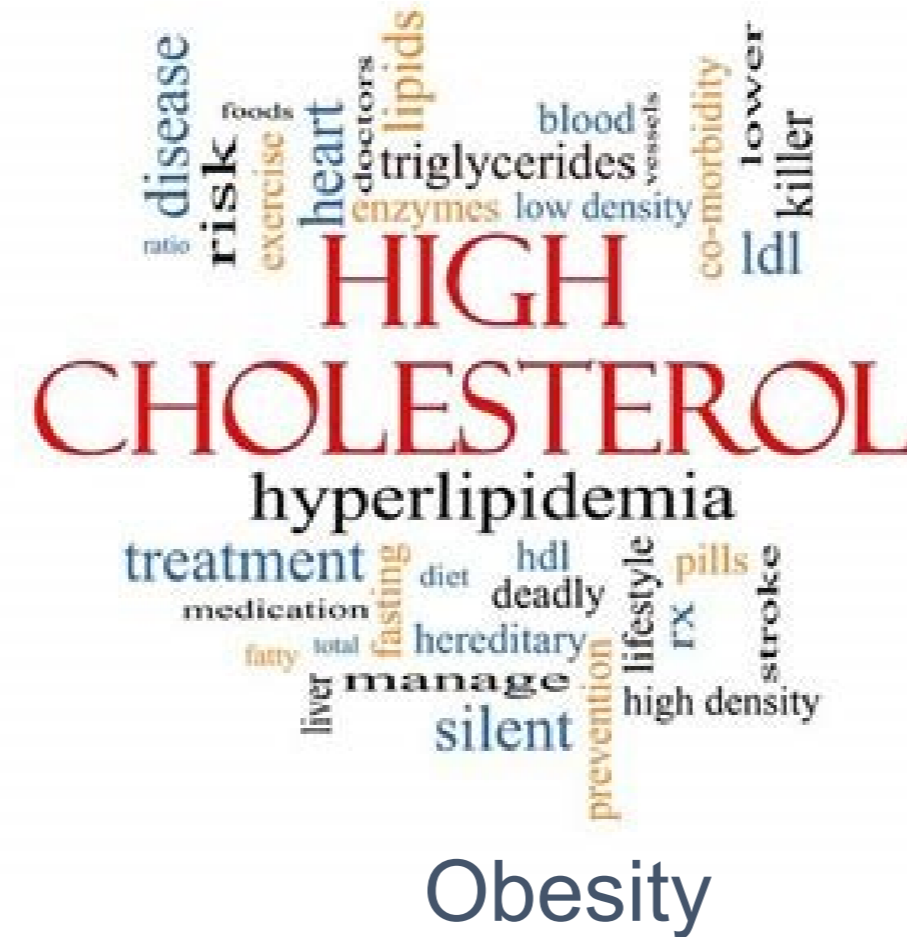
Care team wants simplicity



Claims team wants visibility



Injury was musculoskeletal, yet recovery is not going as planned



What lies beneath



Adverse childhood experiences



Litigation drives poor outcomes

6 weeks post-op visit and 6 sheets of paper to go manage myself

Yawn! I like my couch and Netflix better

Total Knee Arthroplasty Protocol

General Information:

- Walker or crutches should be used until discontinued by Doctor or Physical therapist
- Ice knee frequently with cryocuff/ice pack up to 3-4 x/day
- Change knee position at least once an hour, while awake, to avoid stiffness
- Home exercises should be performed 3x/day
- Rest with pillow under calf/ankle-not knee!

Reminder for stair use:

- Upstairs - the nonoperative leg goes first, then the operative leg, lastly the crutches or cane
- Downstairs - the crutches or cane go first, then the operative leg, lastly the non-operative leg

Rehabilitation:

0-3 weeks

Goals

1. Safe ambulation with walker, crutches or cane (level surface and stairs)
2. Range of motion 0-100 degrees
3. Independent transfers

Exercise

1. Quad sets- tighten knee muscles of out stretched leg by pushing the back of the knee into the bed, hold 5 seconds
 2. Gluteal sets- squeeze buttocks together, hold 5 seconds
 3. Ankle pumps- pump ankles to move feet back and forth
 4. Heel slides- bend knee, sliding foot toward buttocks
 5. Hip abduction- slide leg out to side keeping the knee straight
 6. Knee flexion- sitting in firm chair, slide foot back bending knee as far as possible, hold 5 seconds
 7. Stationary Bike - can begin at 2 weeks
- First five exercises to be done lying on back and repeated 20 times.
 - Normal ADL function

3+ weeks

Goals

1. Range of motion 0-120 degrees
2. Continue physical therapy for exercise instruction, gait training and scar/swelling management

Exercise

1. Straight leg raises, no greater than 2 lbs. (flexion, abduction, adduction)
2. Hamstring curls
3. Heel raises
4. Standing terminal knee extensions
5. Standing hip flexion
6. Standing hip abduction
7. Bridges
8. Short arc quad
9. Pool therapy

important if you have arthritis. The exercises here will help you to stretch and strengthen the areas supporting your joints.

doesn't go away quickly. It's also important to do general fitness exercise. Swimming, walking and cycling may be good, but find something that you enjoy and stick at it. If you have any questions about exercising, speak to your doctor or physiotherapist.

Strengthening
Strengthening exercises are important if you have arthritis because your joints need the support of the surrounding muscles.

Fingers
1. Begin with the palm of your hand on a table or towel on a table, fingers apart.
2. Pull your fingers together by pressing your hand down into the table and bunching up the towel between your fingers.

Wrists
1. Place your palm on a table and lift your fingers up away from the table.
2. Place your other hand across your knuckles at a right angle and push down as the hand underneath tries to go up.
3. You should feel the muscles of your forearm contracting. Swap hands and repeat.

Arms
1. Stand with your arm straight, bend your elbow, then straighten it out again. (Try holding a weight in your hand such as a bag of sugar or a potato. If you find holding objects difficult, you can use wrist weights.)
2. Stand with a weight in each hand, or use wrist weights. Raise your arms overhead as far as you can and lower slowly.
3. Stand with a weight in each hand, or use wrist weights. Place your arms by your sides. Slowly lift your arms away from your body, keeping the elbows straight. Hold for five seconds and slowly lower.

Feet
1. Stand up from a chair without using your hands for support. Repeat until you get short of breath.
2. Step onto a stool at the bottom step of stairs with the first foot. Bring up the second foot, then step down with the first foot, followed by the second foot. Repeat with each leg until you get short of breath. Hold on to the banister if necessary.
3. Sit on the back of a chair or a work surface. Lift one knee up towards your chest as far as you can. Lower again, then repeat with the other leg. Do as many as you can until you feel short of breath.
4. Sit on the edge of a table or bed. Cross your ankles over.
5. Push your front leg backwards and back leg forwards against each other until your thigh muscles become tense. Hold for 10 seconds, then relax. Switch legs and repeat.
6. Sit on the edge of a table or bed, keeping an upright posture with your feet on the floor. Straighten one knee fully flat, then slowly lower. Repeat on the other leg. As you improve, try using ankle weights. If your knee is hot or swollen, seek advice before using ankle weights.

Stretching
Stretching exercises also known as range of movement exercises are designed to make sure your joints are moved as far as they safely and comfortably can be.

Fingers
1. Make a fist, then straighten your fingers.
2. Bend the first two joints of your fingers down, then straighten again.

Neck
1. Sit with good posture. Slowly turn your head one side and then the other.
2. Sit or stand with good posture. Lower your chin to your chest, then return to the starting position.
3. Sit or stand with good posture. Keeping your head level, pull your chin back. Relax, then repeat. Seek advice if you feel dizzy during any of these exercises.

Feet
1. Bend your ankle up towards your body as far as possible, then point your toes away from your body.
2. Move your ankle around slowly in a large circle. Repeat in the opposite direction.

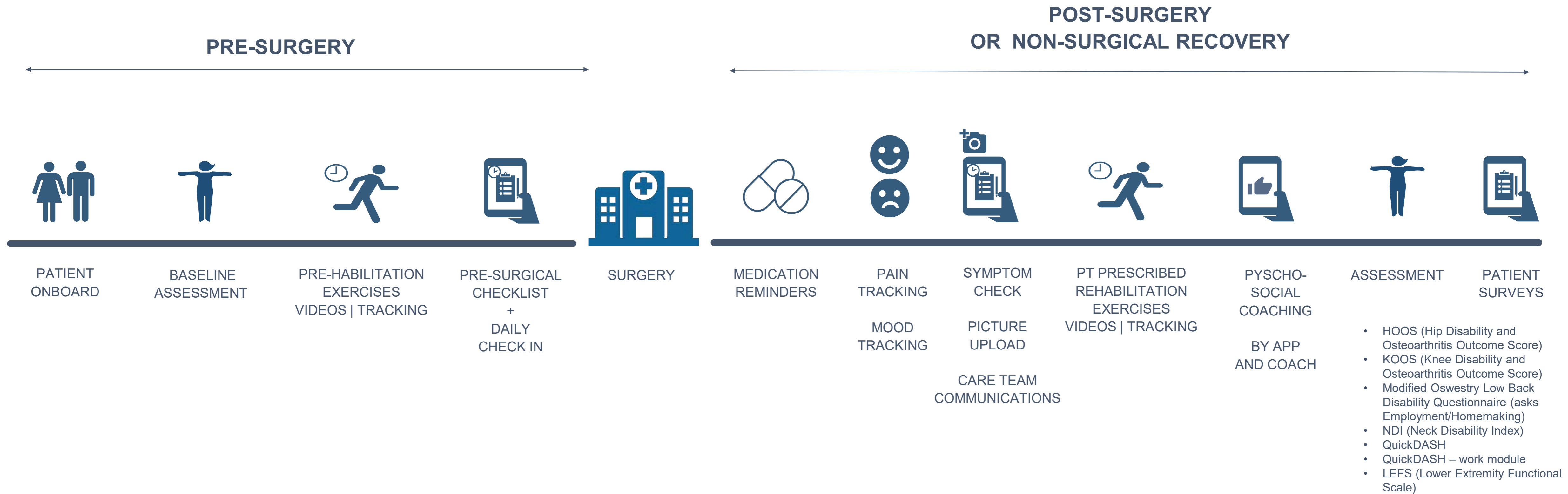
Hips
1. Sit with your knees bent and feet together. Press your knees down towards the floor, using your hands if you need to. Alternatively, sit on your back and part your knees, keeping feet together.
2. Lie on your back. Pull each knee to your chest in turn, keeping the other leg straight.

Shoulders
1. Stand with your arms raised straight up.
2. Stand with your arms raised and bent at the elbow, hands behind your head.
3. Lie on your back with your arms raised straight up.

Back
1. If you're able to, lie on your back, hands behind your head.
2. Lie on your back with knees bent. Bring one knee up towards your chest.
3. Lie on your front with your hands under your chin.
4. Place your hands on your hips and bend.

Structured Episode of Care Management Programs

Requires injured workers to be disciplined in following their care protocol



Hybrid care model

What it takes to get injured workers to follow care program and decrease claims cost



Injured worker follows program at home

Including PT/OT prescribed home exercises



App delivers structured program

Sensor tracks progress



Coach motivates injured worker



Care team and claims team gains real time recovery data



Coach monitors and engages clinic for quicker intervention



Quality recovery and quicker return to work

How to engage injured workers at home

Improve At Home Care With Advanced Digital Insights

Non-Surgical Patients | Conservative Care | Surgical Patients | Chronic Pain | Catastrophic Cases | Old Claim Cases

MARIA GOT INJURED AT WORK

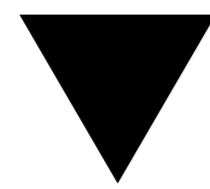
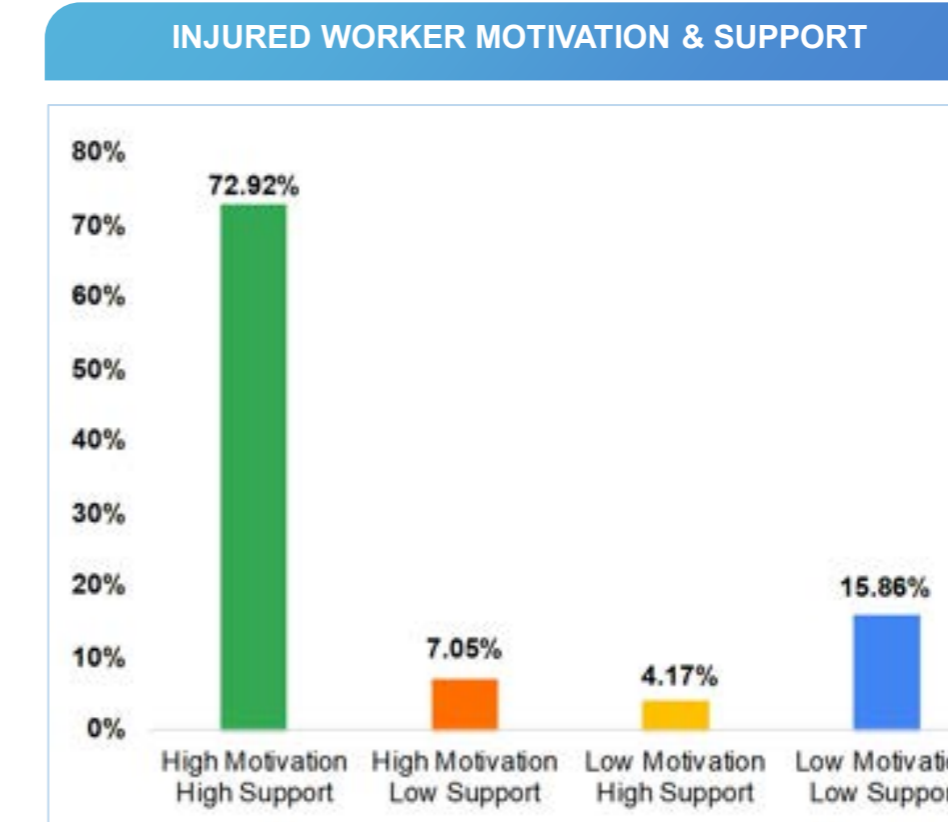
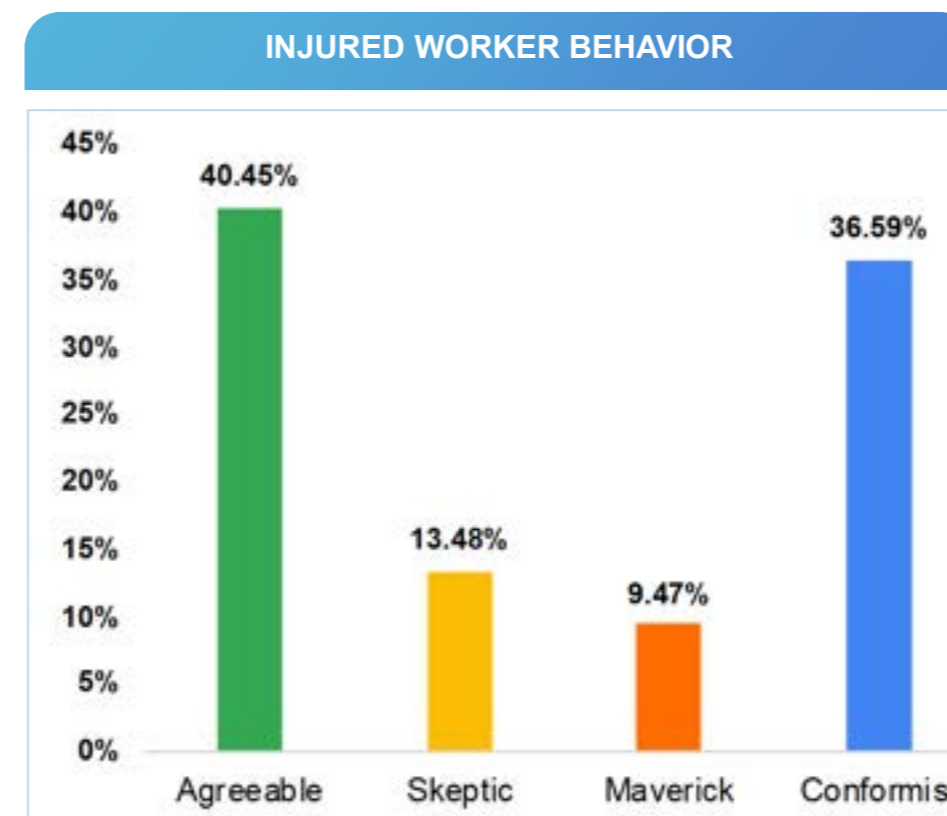
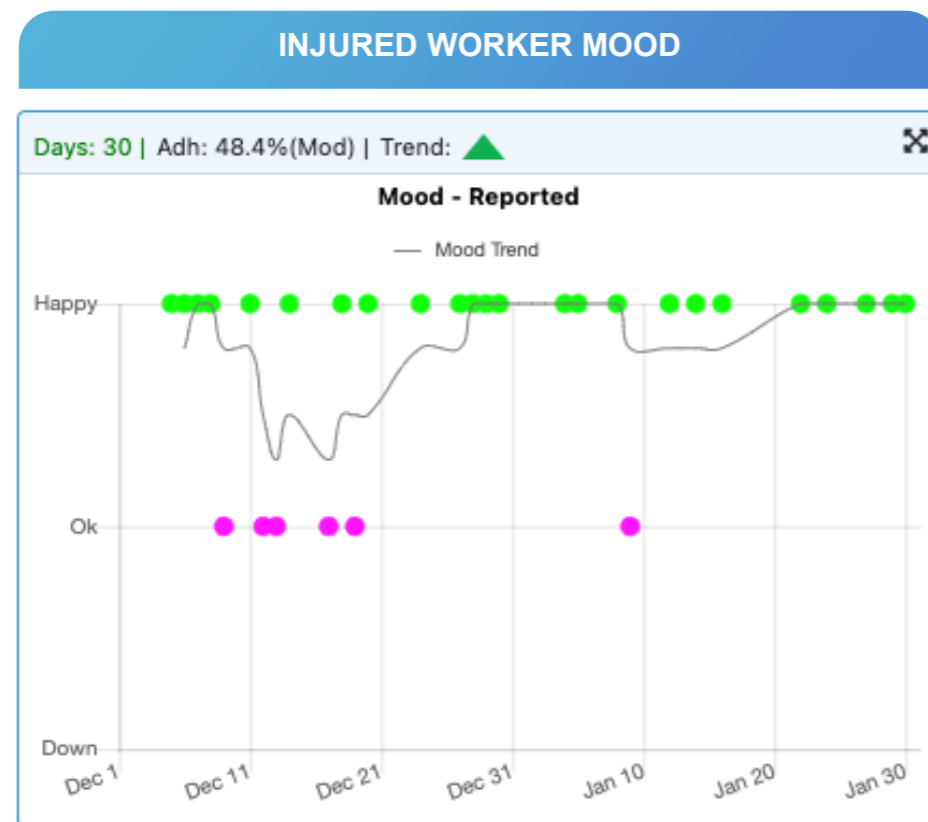


1. BIO-PSYCHO-SOCIAL PATIENT ENGAGEMENT MODEL
2. ADVANCED DATA DRIVEN RECOVERY
3. PERSONALIZE INJURED WORKER EXPERIENCE
4. QUICKER INTERVENTION
5. ADDRESS BARRIERS TO RECOVERY

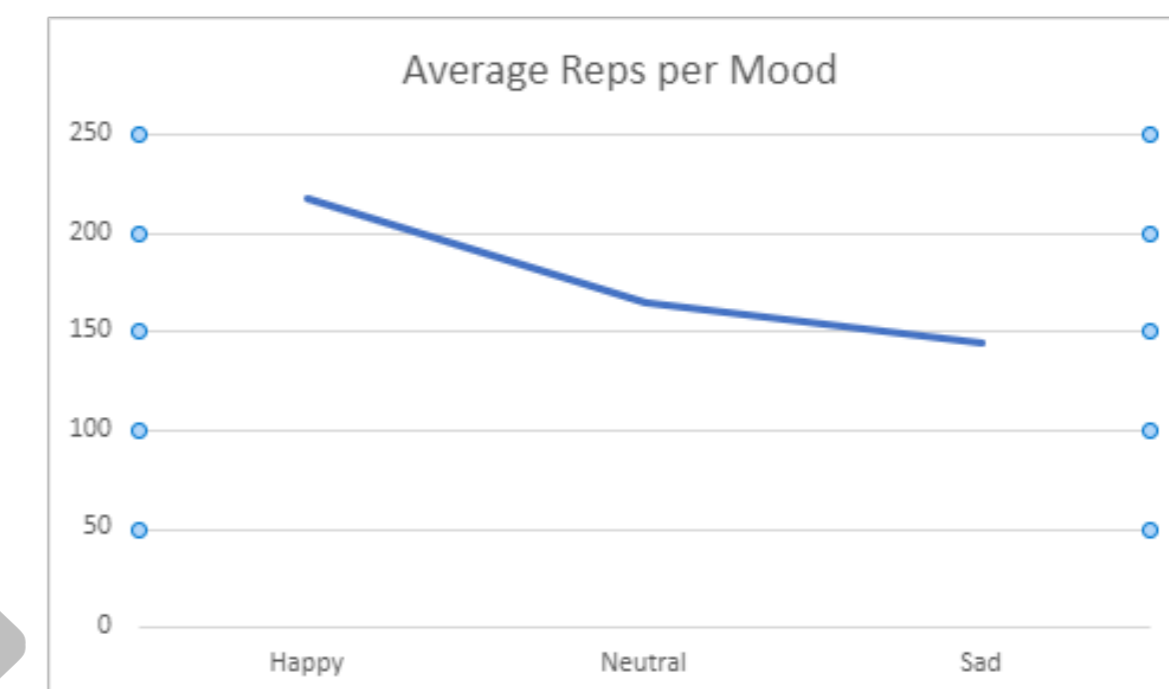
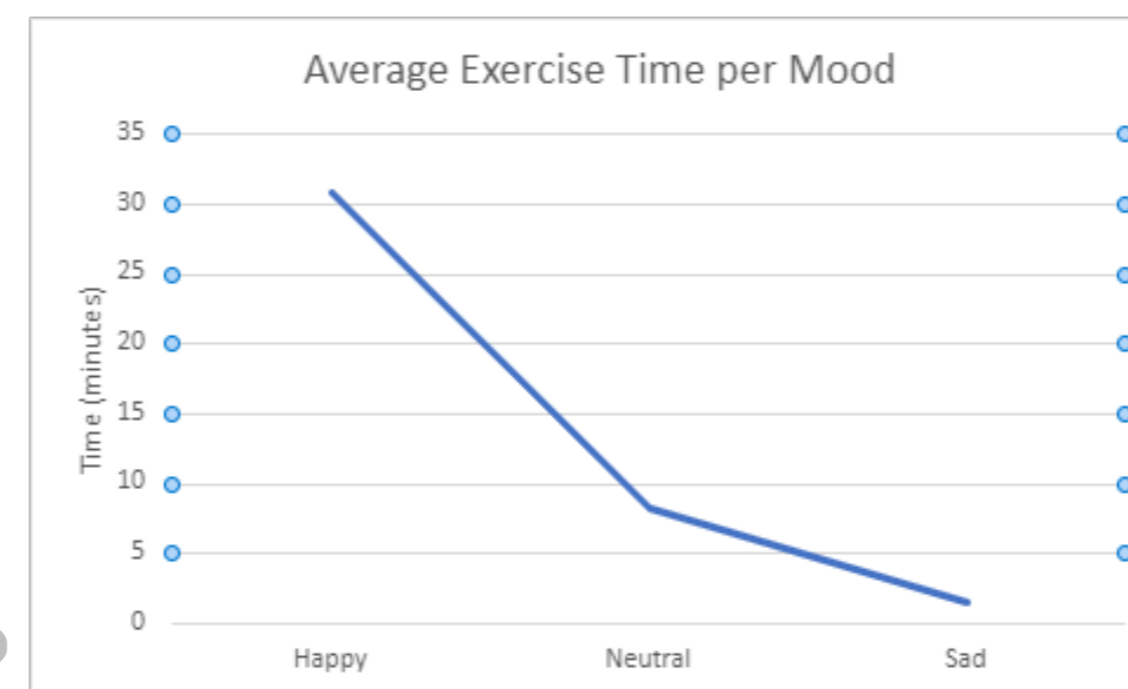
JOHN NEEDS KNEE REPLACEMENT



Bio-Psycho-Social Patient Engagement Model

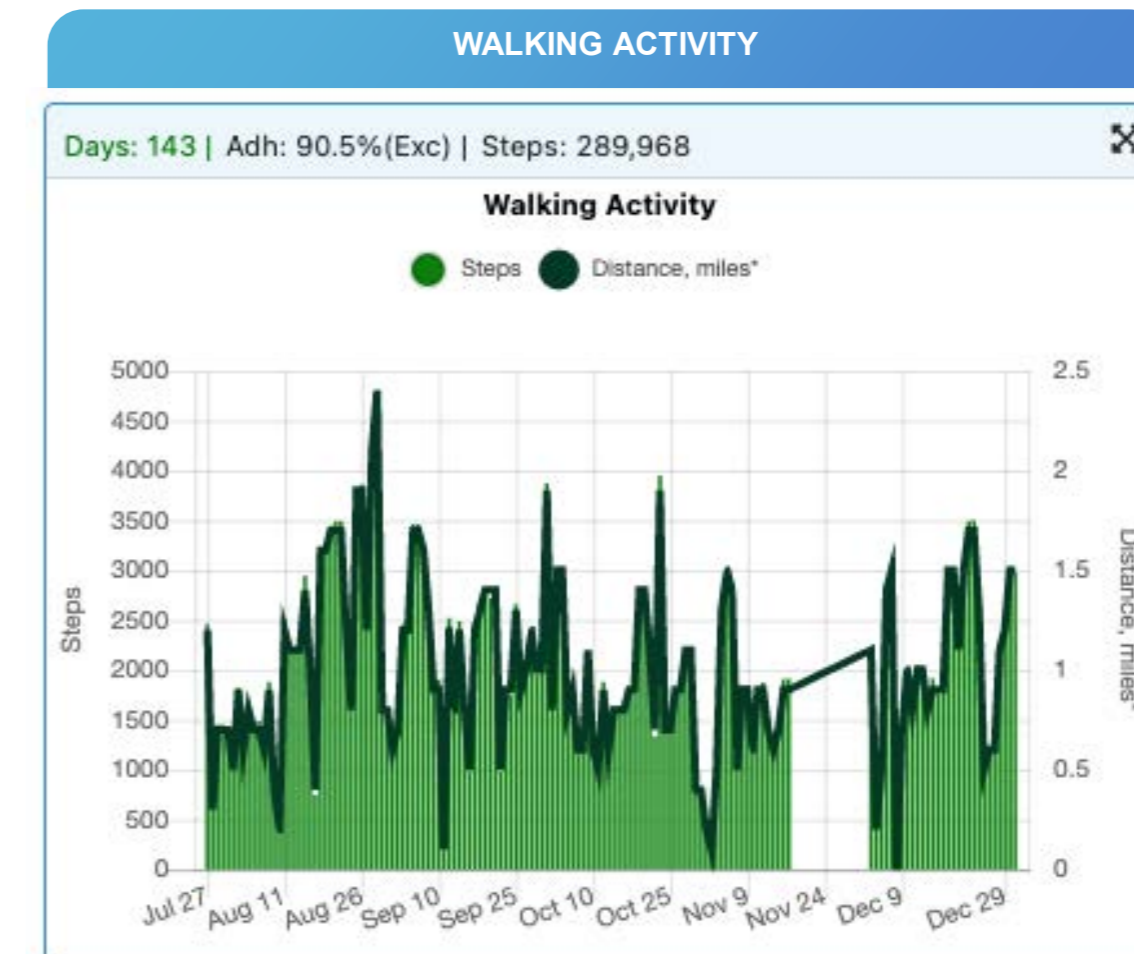
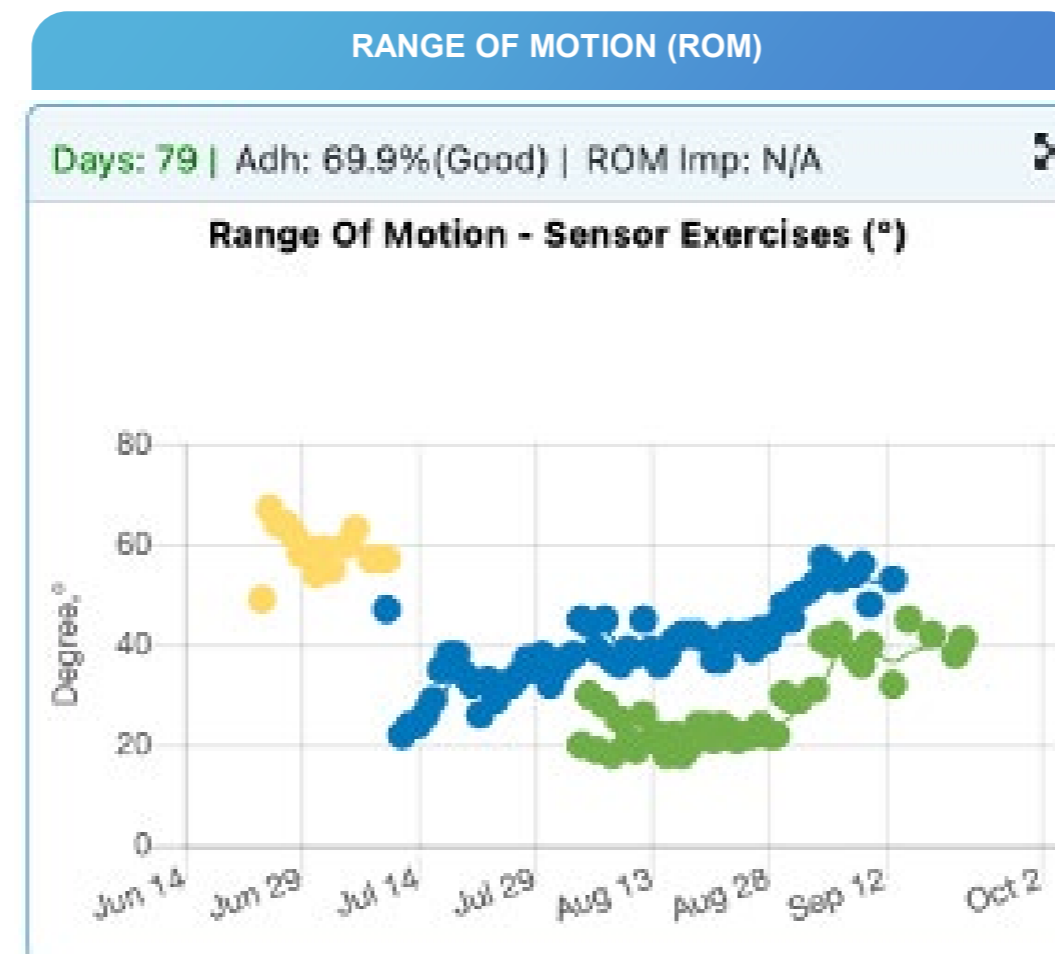
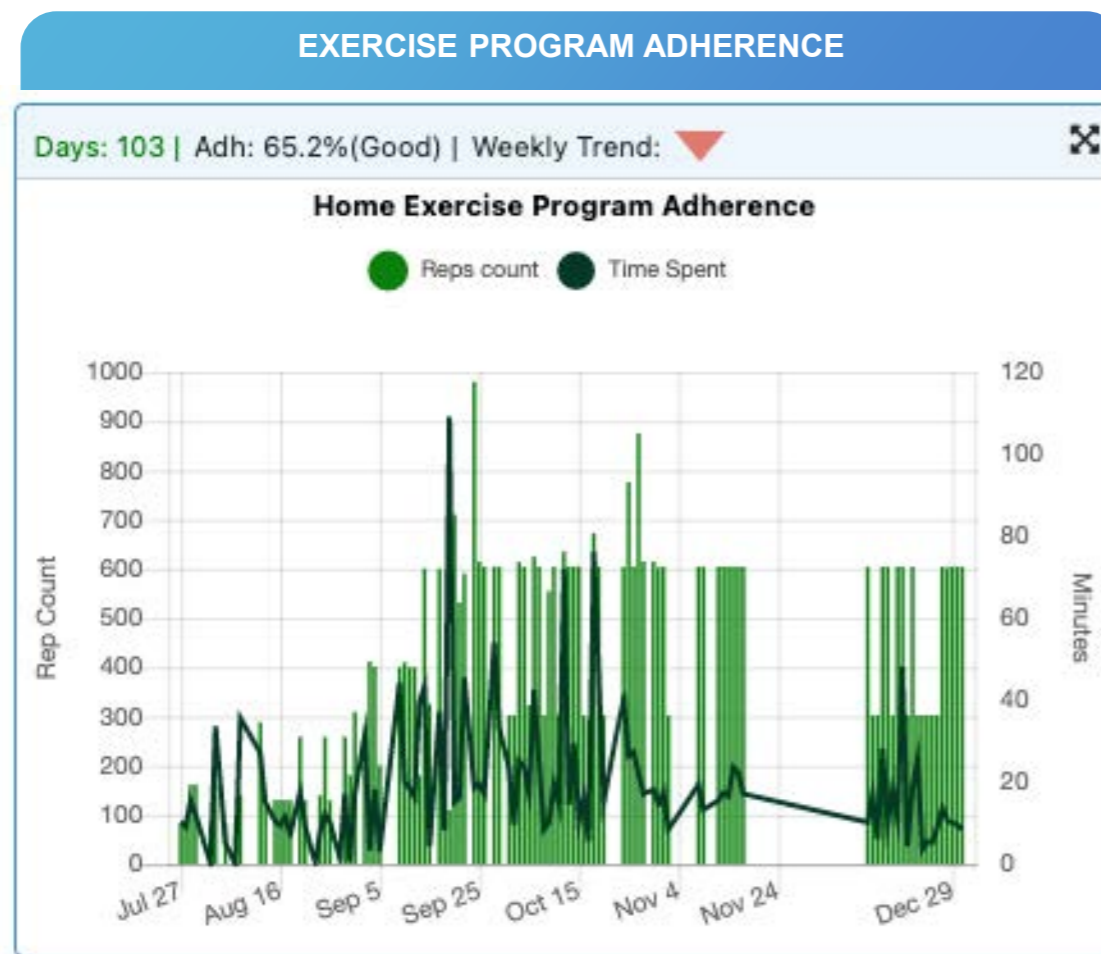


	Avg. Reps	Avg. HEP Time (minutes)
Happy	217.6	30.8
Neutral	164.9	8.24
Sad	144.59	1.49

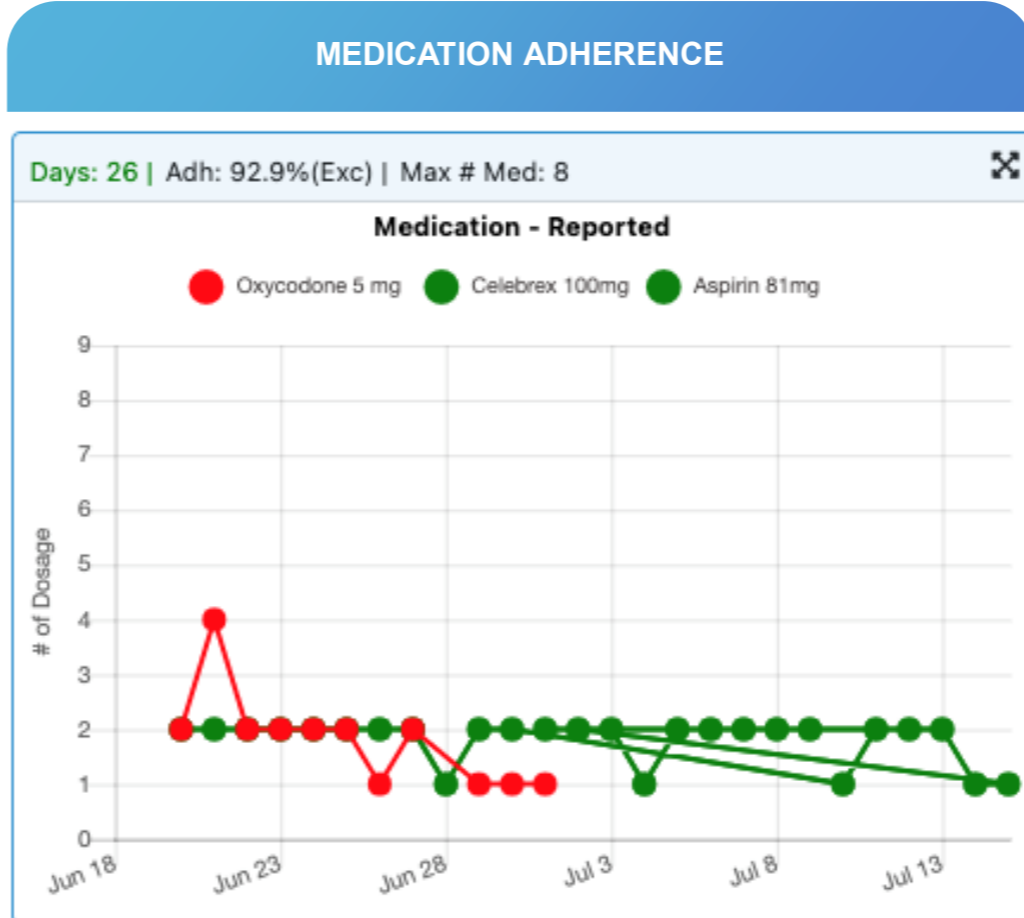
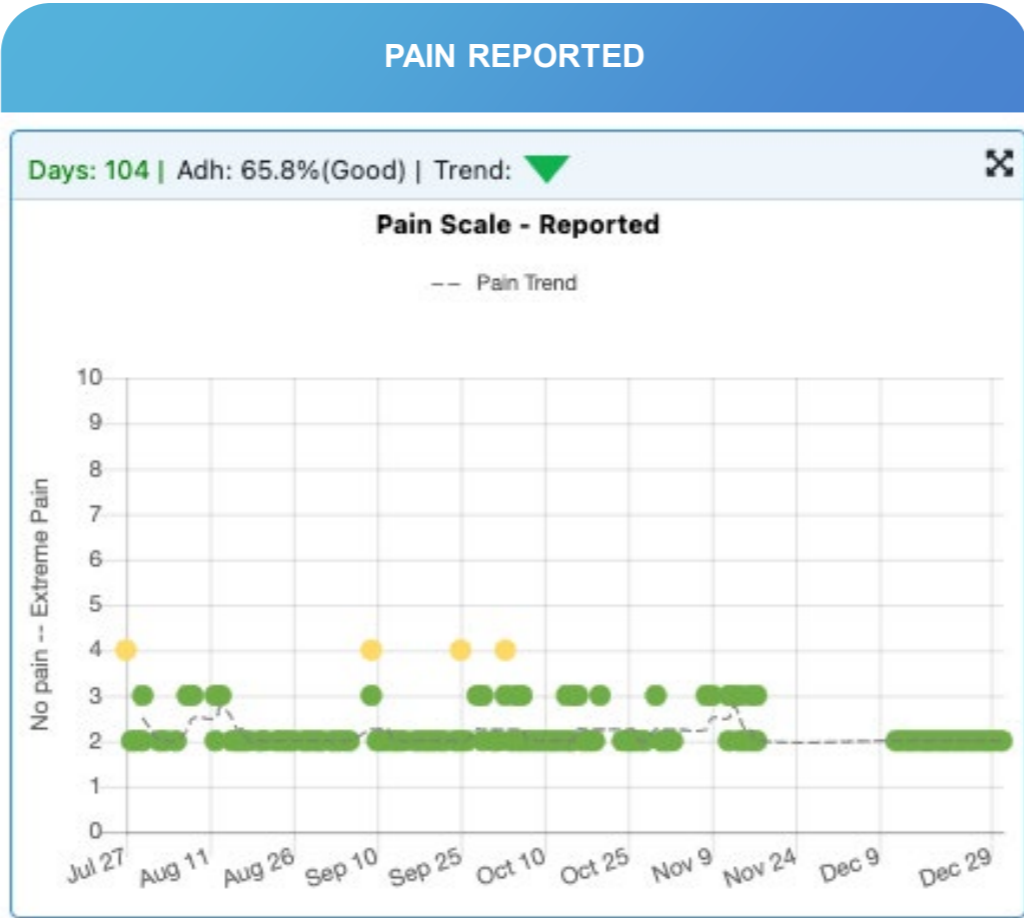
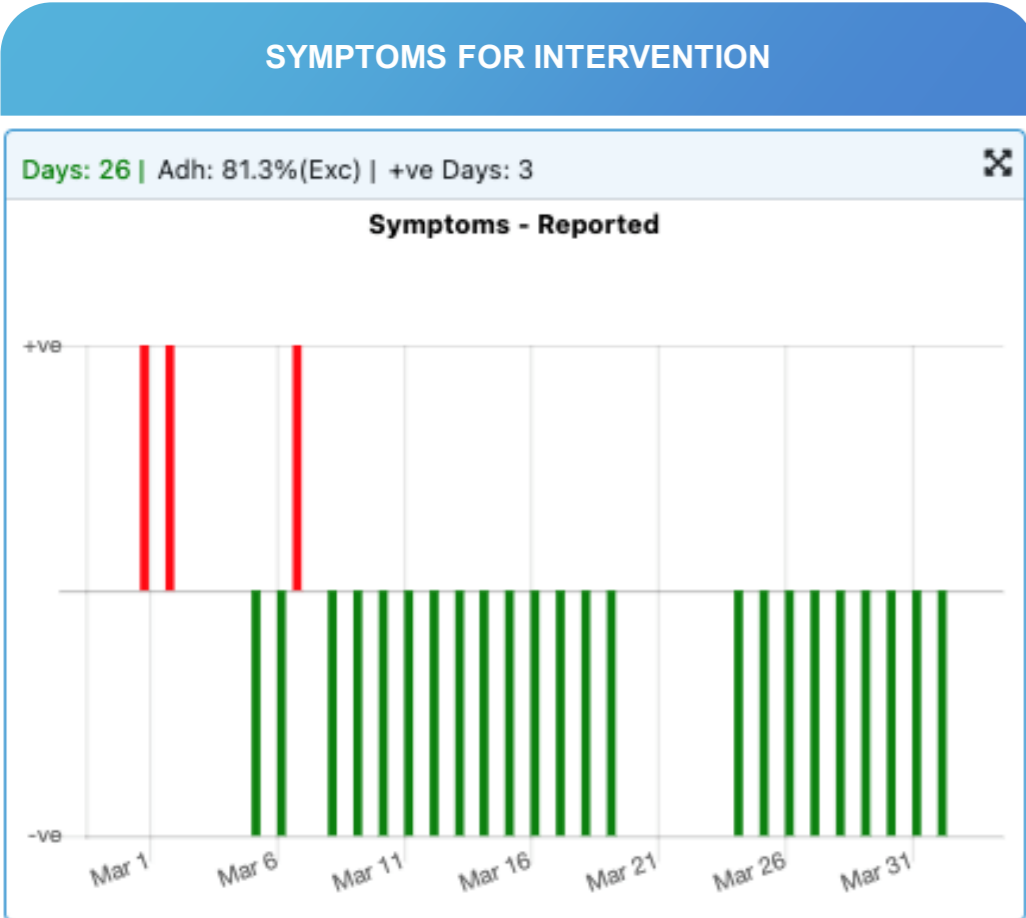


Recovery progress

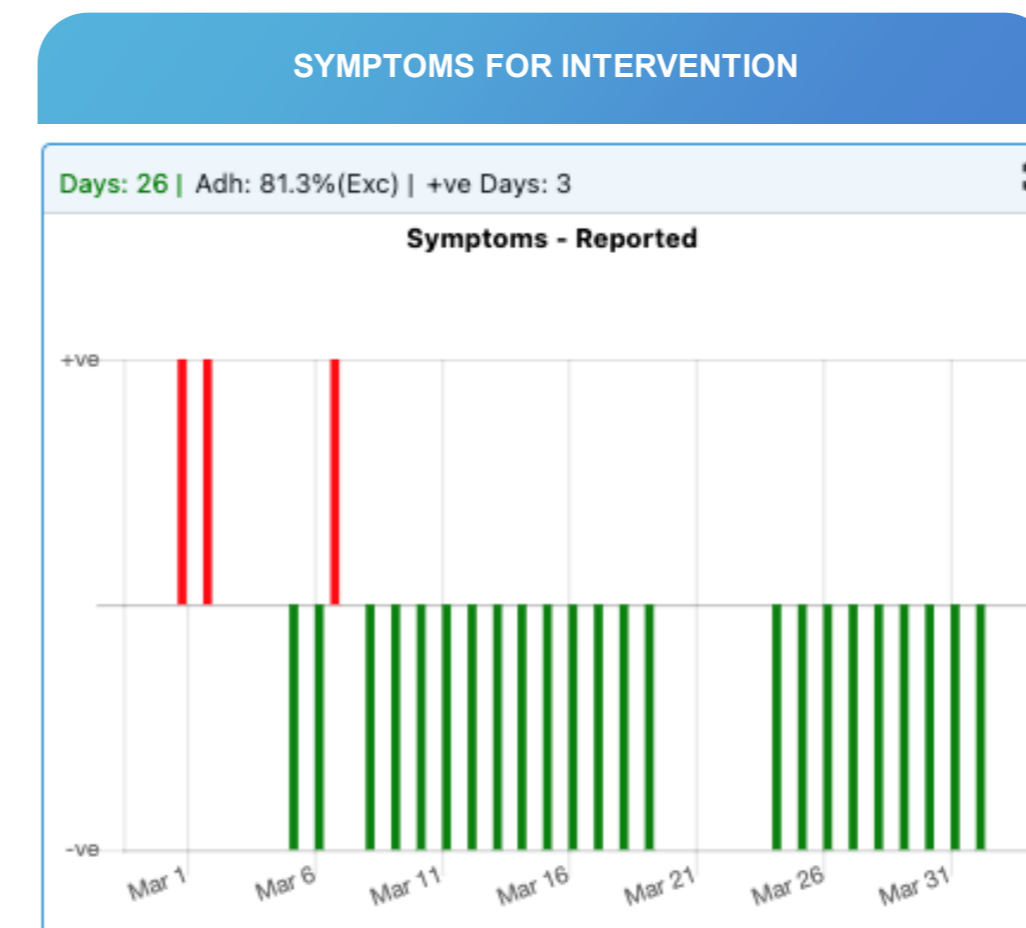
Pathway to MMI, Reduced TD and Care Costs



Opportunity for early intervention



Prevent unnecessary clinic visits, ER visits and second surgeries



Non-Surgical Case (Ankle)

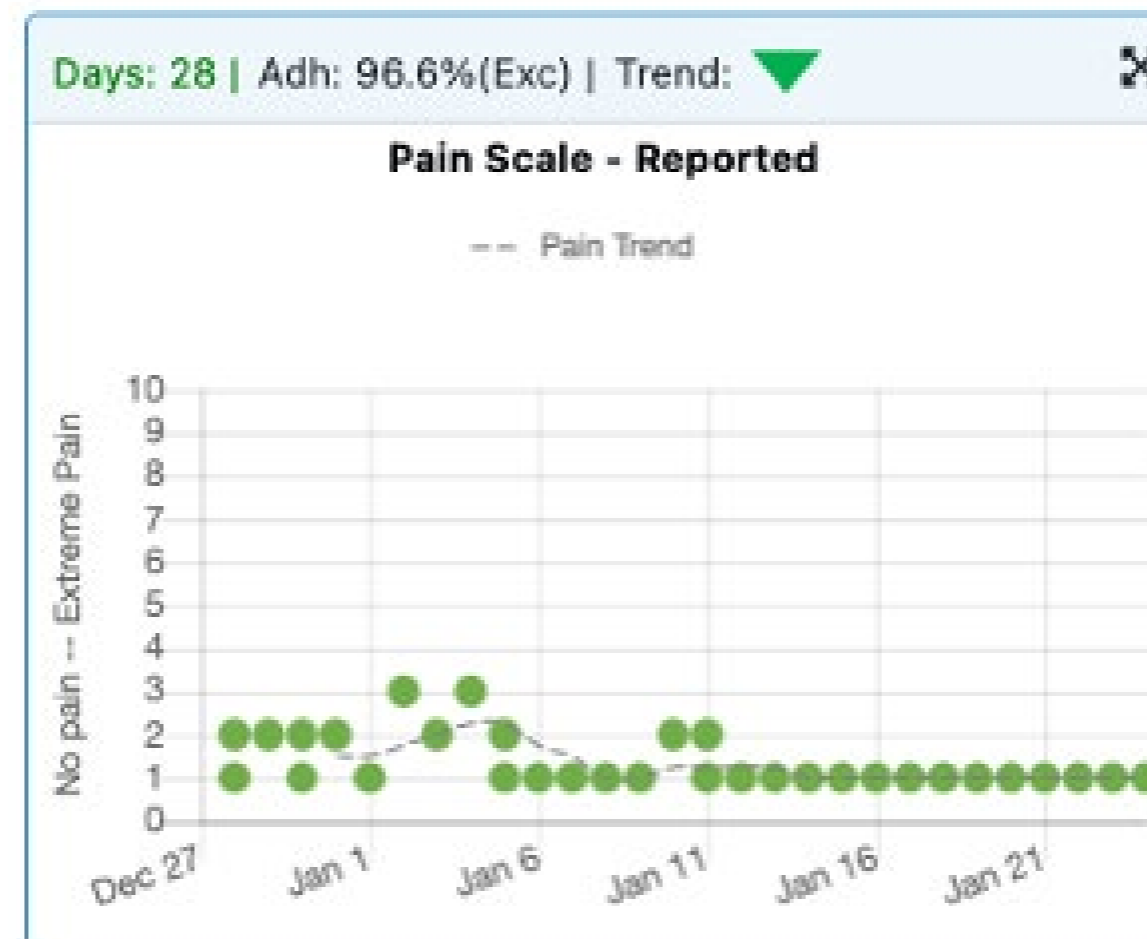
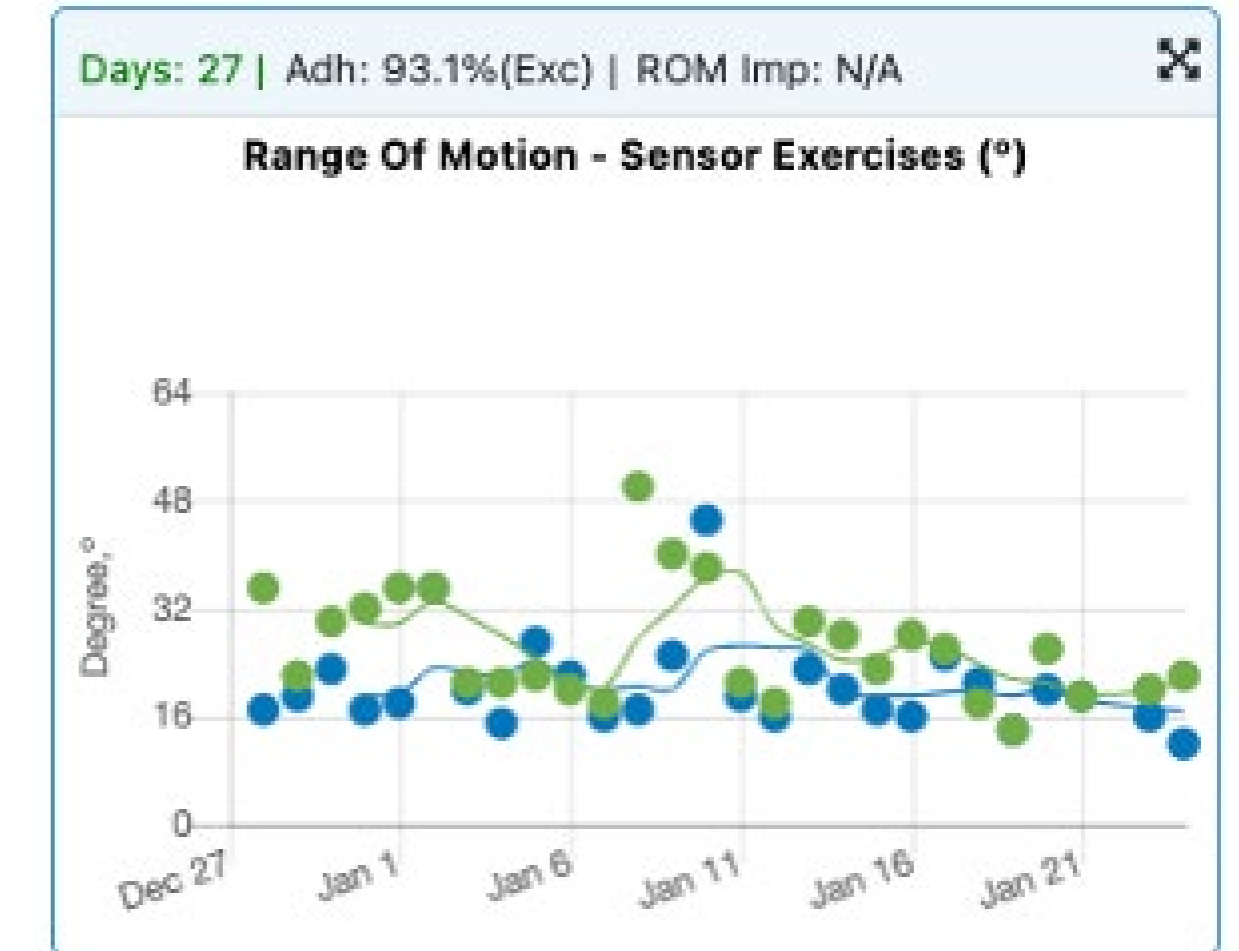
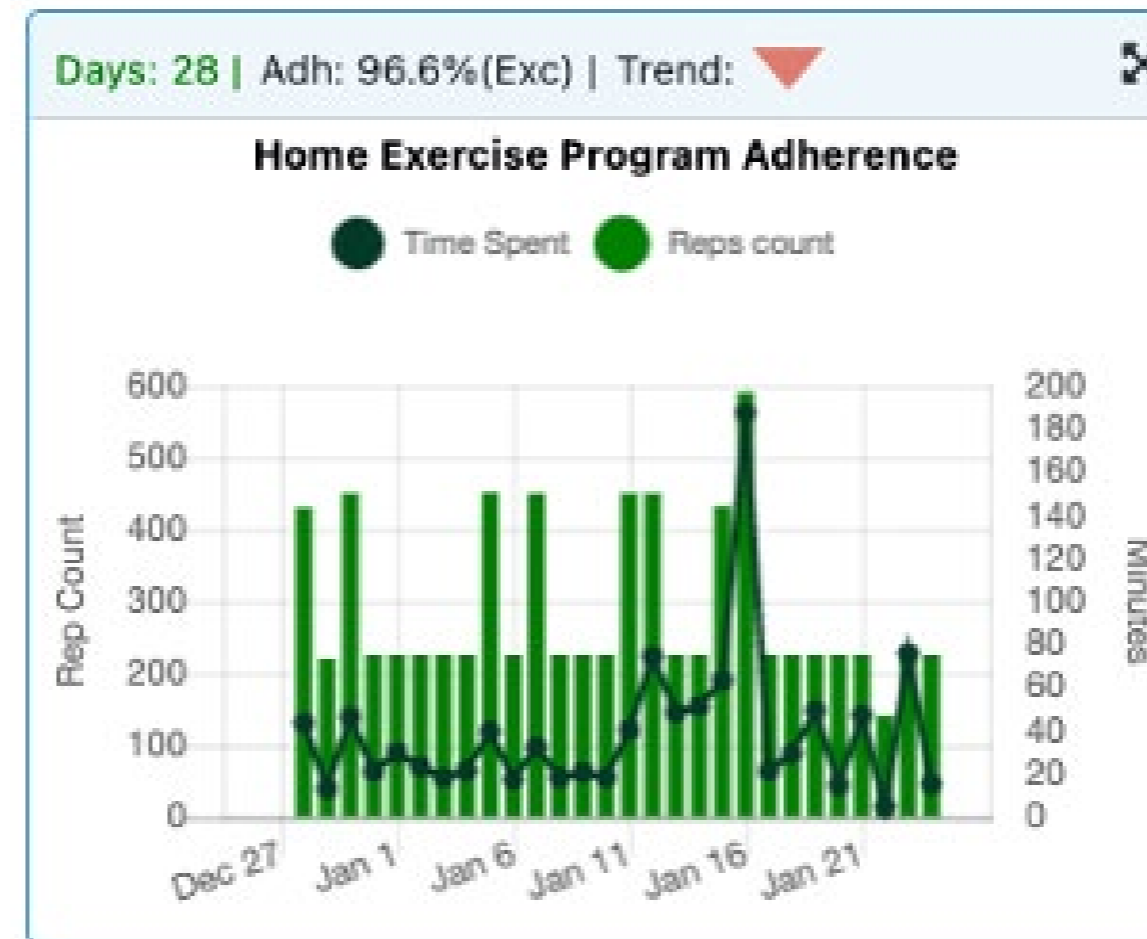
Reporting Period: 12/27/2022 – 01/24/2023

History

Patient is a **30 year old female** who presented with right ankle pain after a right fibular fracture in 9/22. Ankle was treated non-operatively.

Current Status

- Over her treatment plan, patient's pain has decreased from 3/10 to 0-1/10.
- Range of motion has stayed consistent throughout.
- Patient continues using Recupe for her recovery, and has progressed from resisted activity to full weight-bearing functional activities, showing good progress.



Non-Surgical Case (Lower back and osteoarthritis)

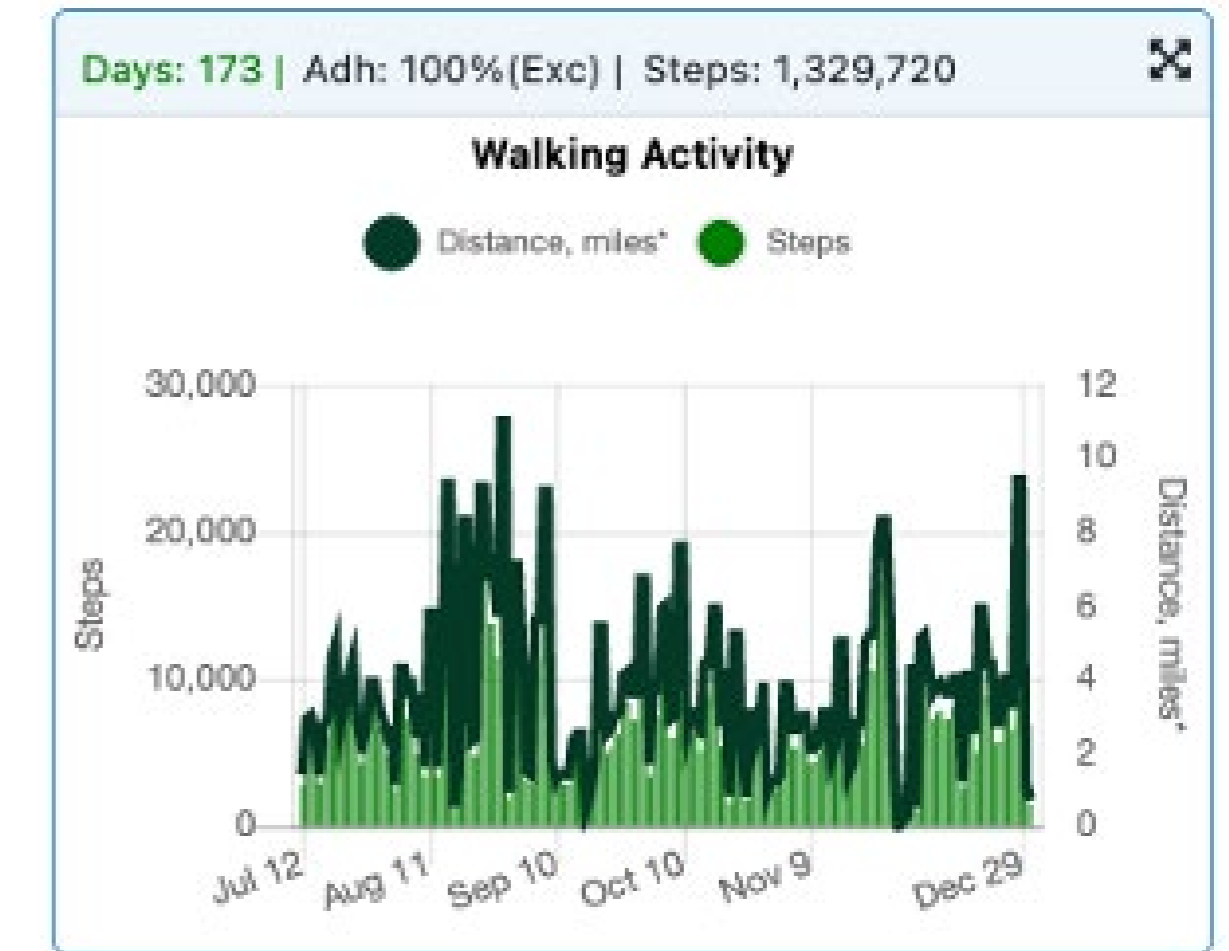
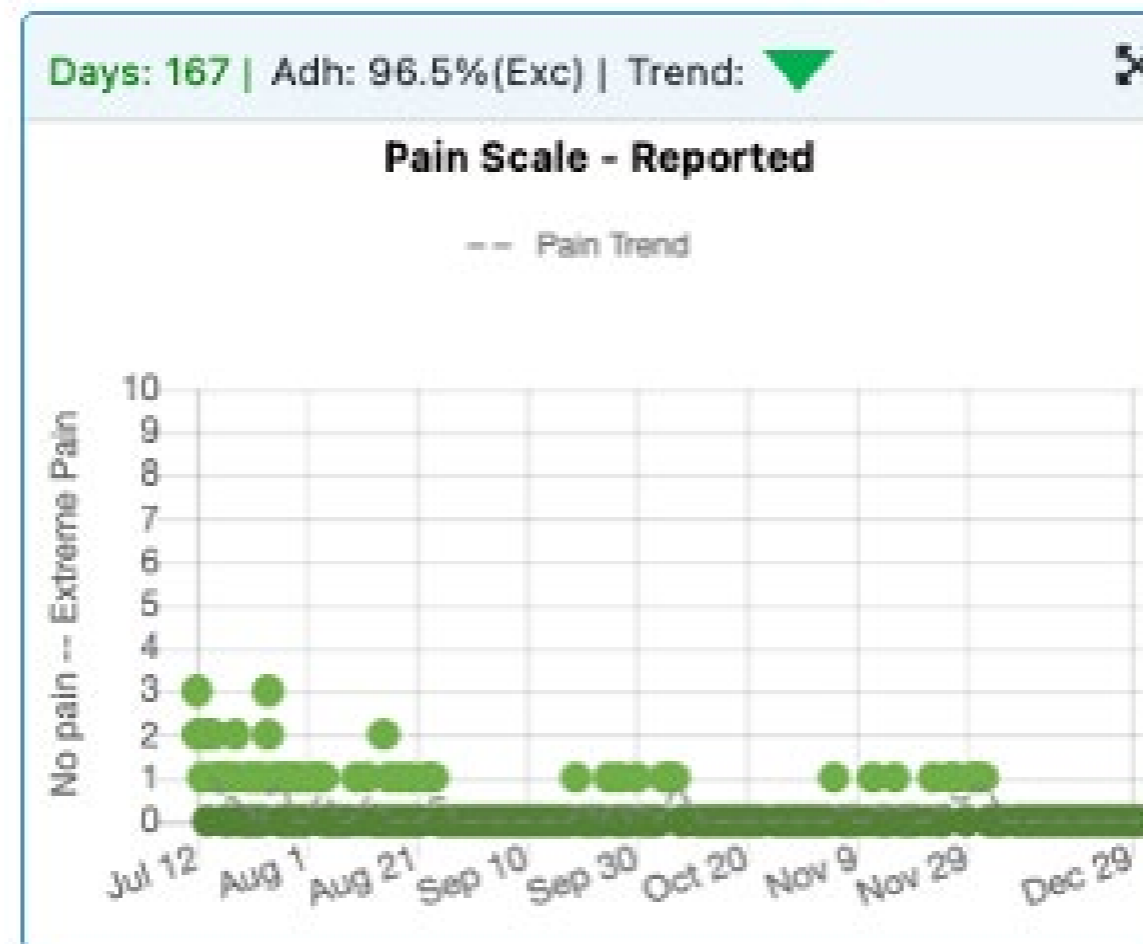
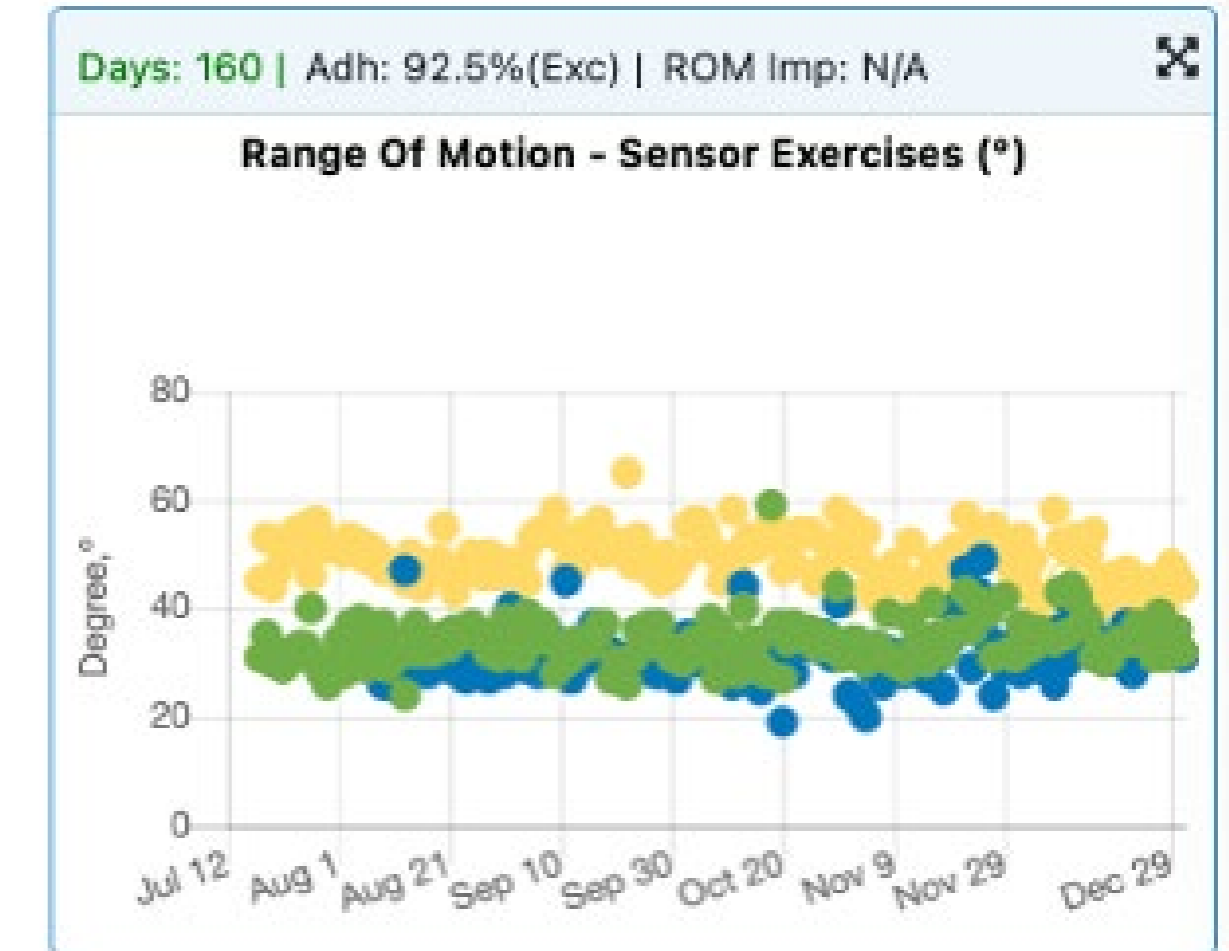
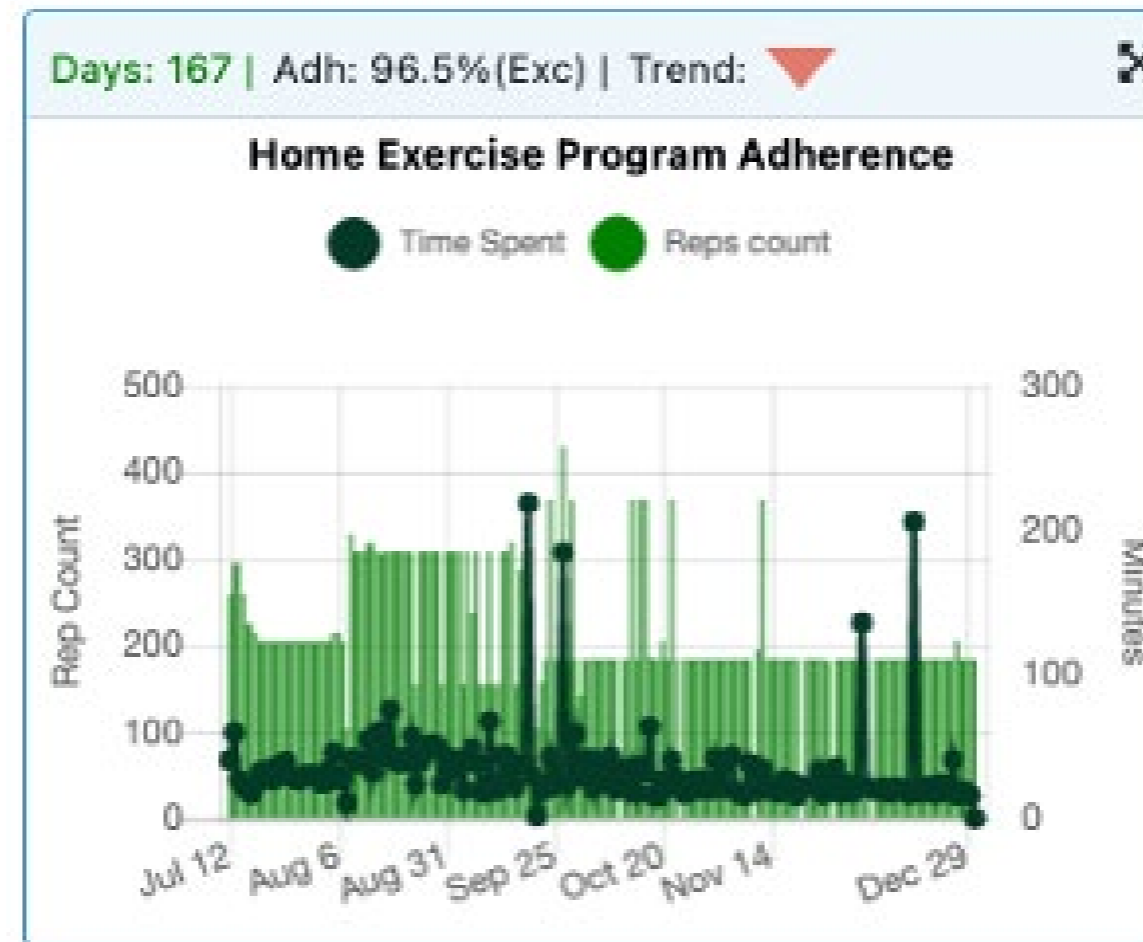
Reporting Period: 07/12/2022 – 12/31/2022

History

Patient is a **70 year old female** who presented with lower back pain and osteoarthritis in the lumbar spine and left hip. Previous treatments included outpatient physical therapy and SI joint injections.

Current Status

- Over course of treatment, pain decreased from 3/10 to 0/10, no pain.
- Range of motion has been consistent throughout treatment.



Surgical Case

(Knee)

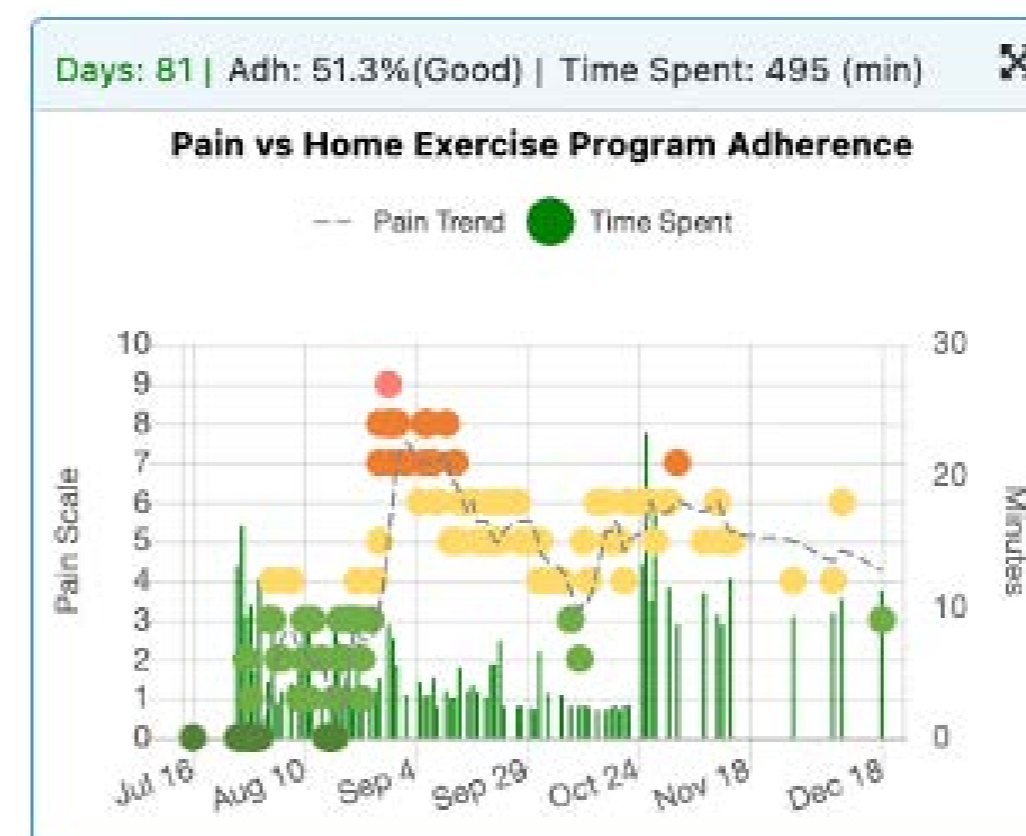
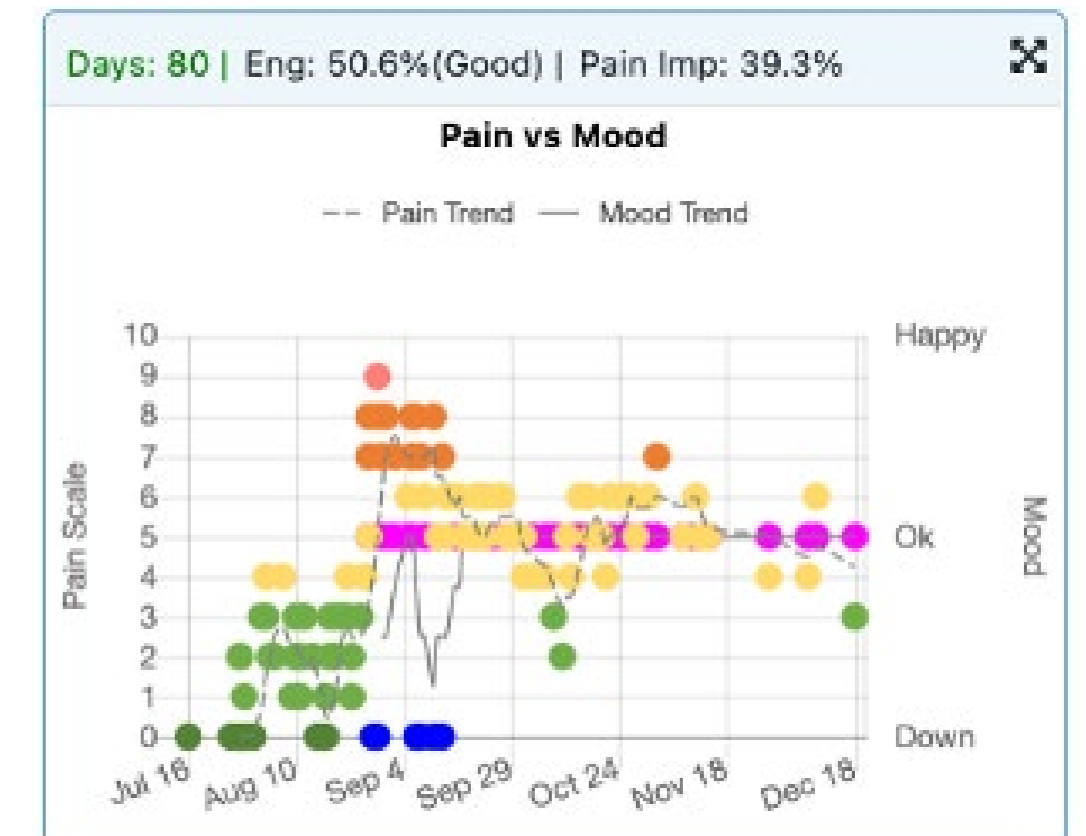
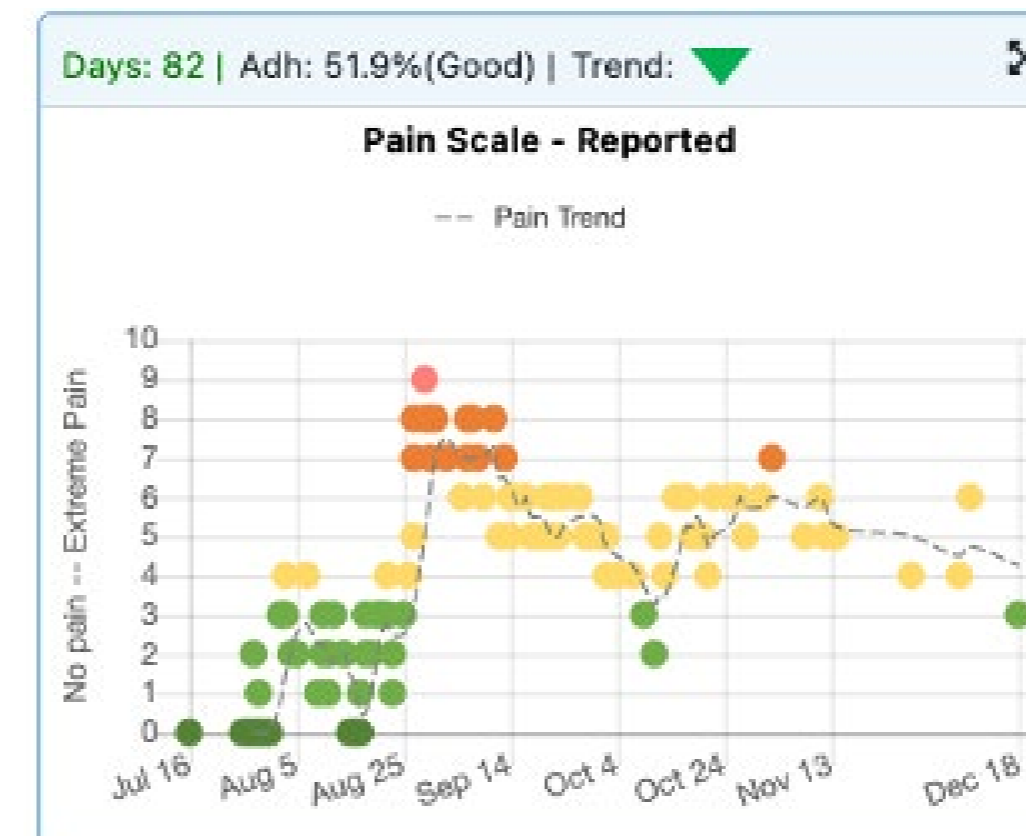
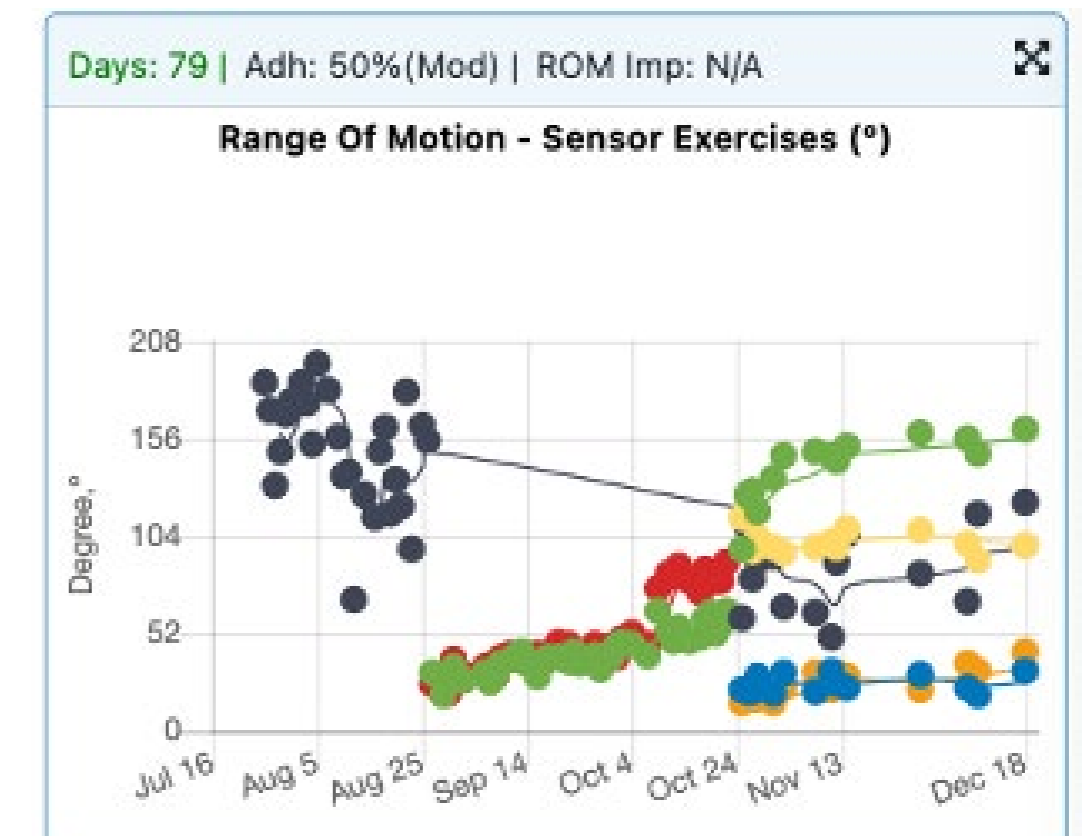
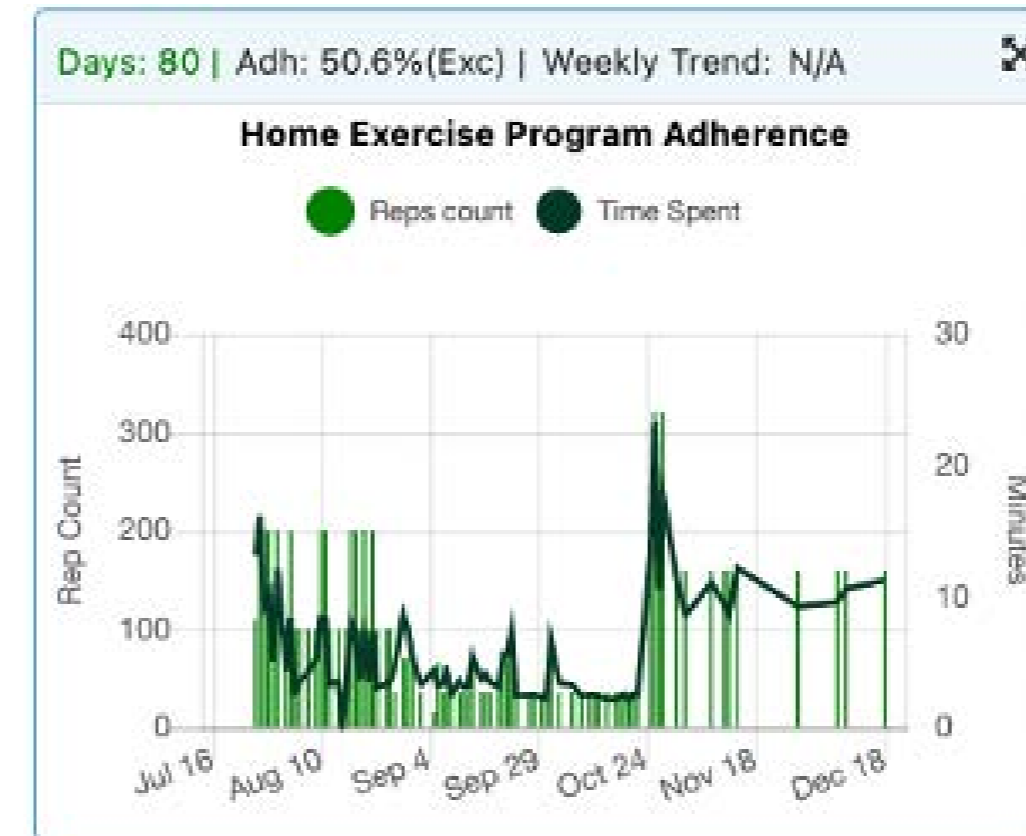
Reporting Period: 07/16/2021 – 12/20/2021
Date of Surgery: 08/27/2021

History

Patient is a **25 year old female** who underwent a left knee medial patellofemoral ligament reconstruction on 8/27/21. She was onboarded on 7/12/21 for pre-surgical exercises.

Current Status

- Over her post-surgical recovery, her pain decreased from 9/10 to 3/10.
- Her exercises progressed from active-assisted range of motion to functional resisted activities, showing good progress.
 - Pre-op = 42 days
 - Post-op = 115 days
 - Pain trend decreasing
 - Pain improvement = 39.3%
 - Mood trend increasing
 - ROM progression increasing
- Due to her progress, her program ended on 12/20/21.



Surgical Case

(Shoulder)

Reporting Period: 11/08/2022 – 12/31/2022

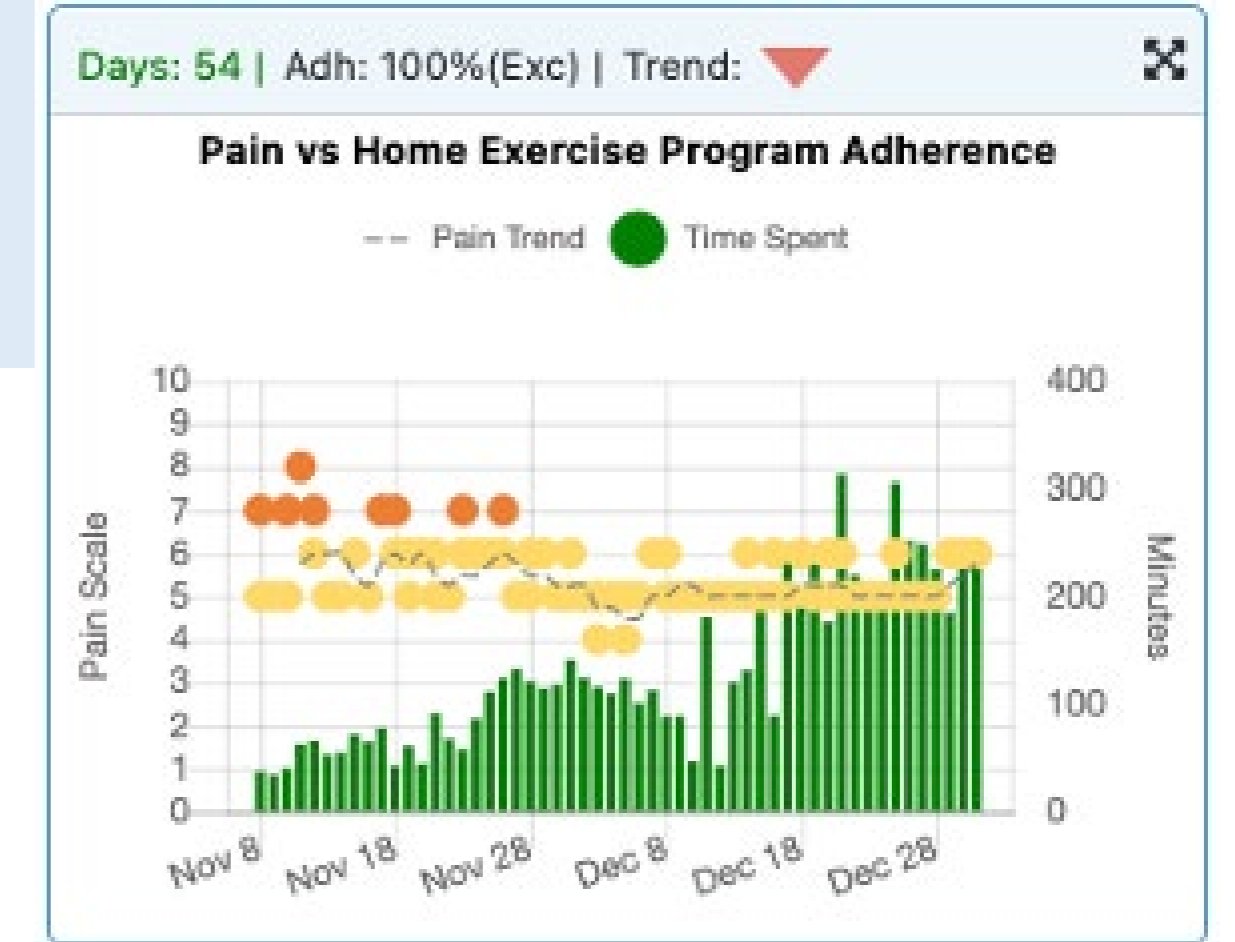
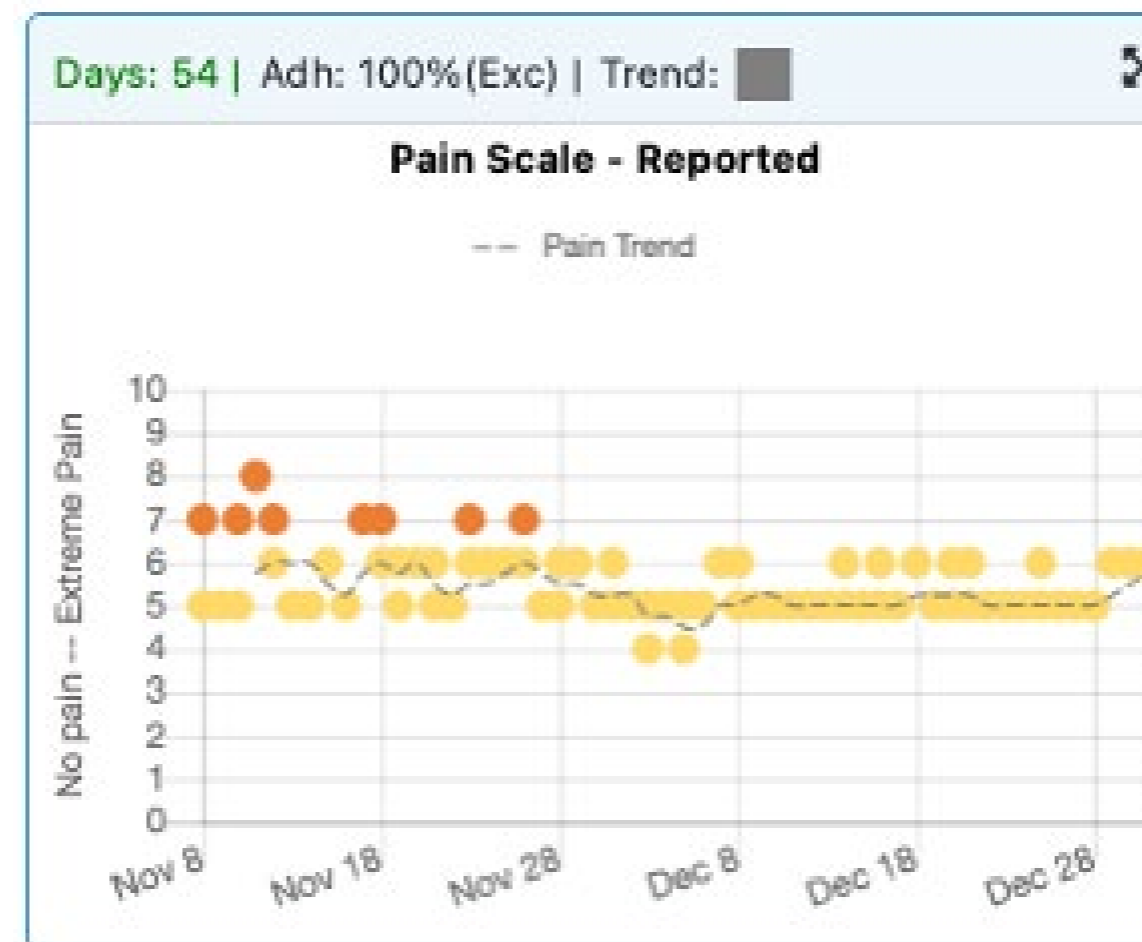
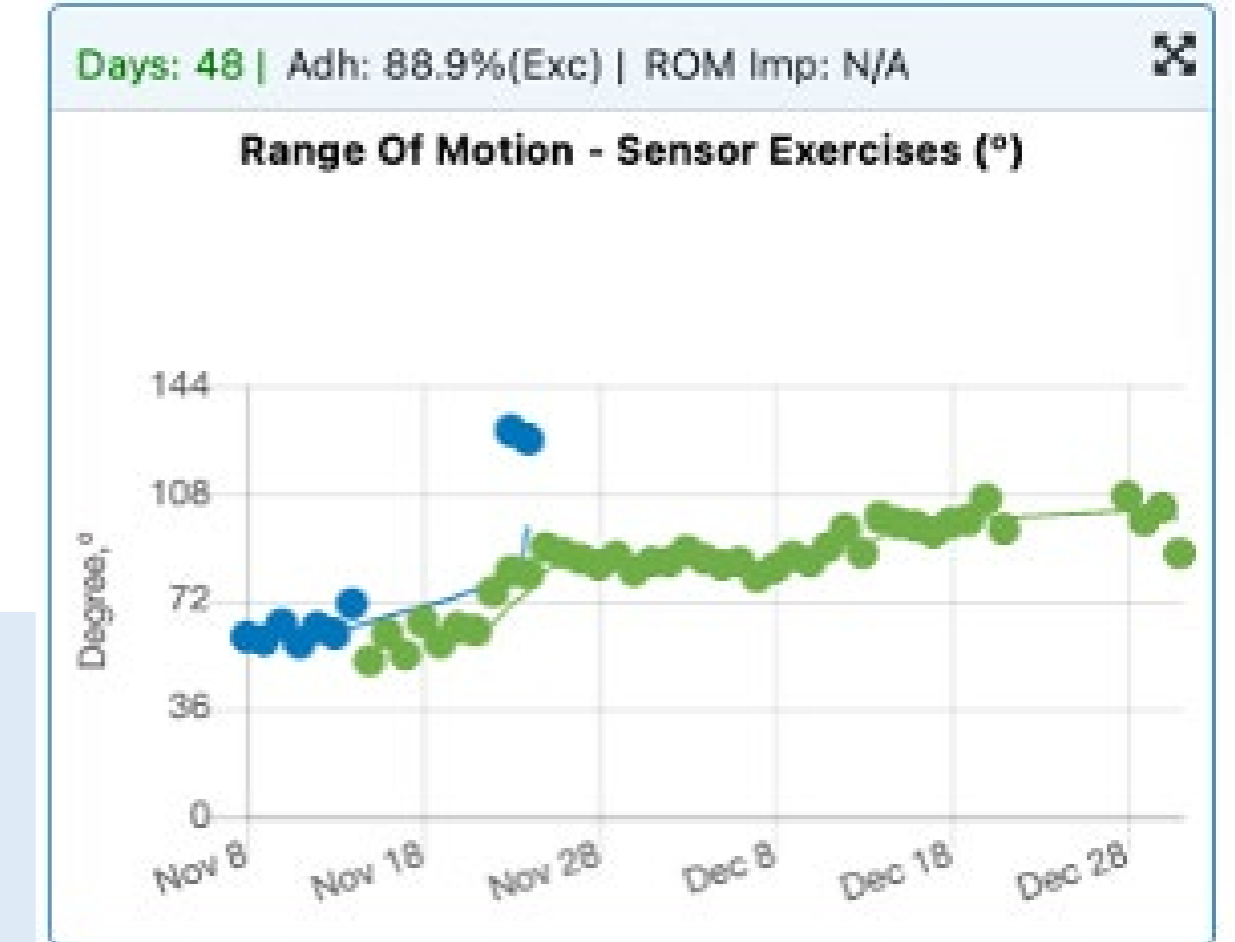
Date of Surgery: 10/28/22

History

Patient is a **50 year old bakery technician** who was onboarded for rehabilitation after a left rotator cuff repair (supraspinatus).

Current Status

- Patient's exercise plan has progressed well, from active-assisted range of motion exercises to resisted exercises. This shows good functional gain.
- Pain has decreased from 8/10 to 5/10.
- Patient continues to use Recupe for full functional recovery.



Old Claims Case

(Tear in rotator cuff)

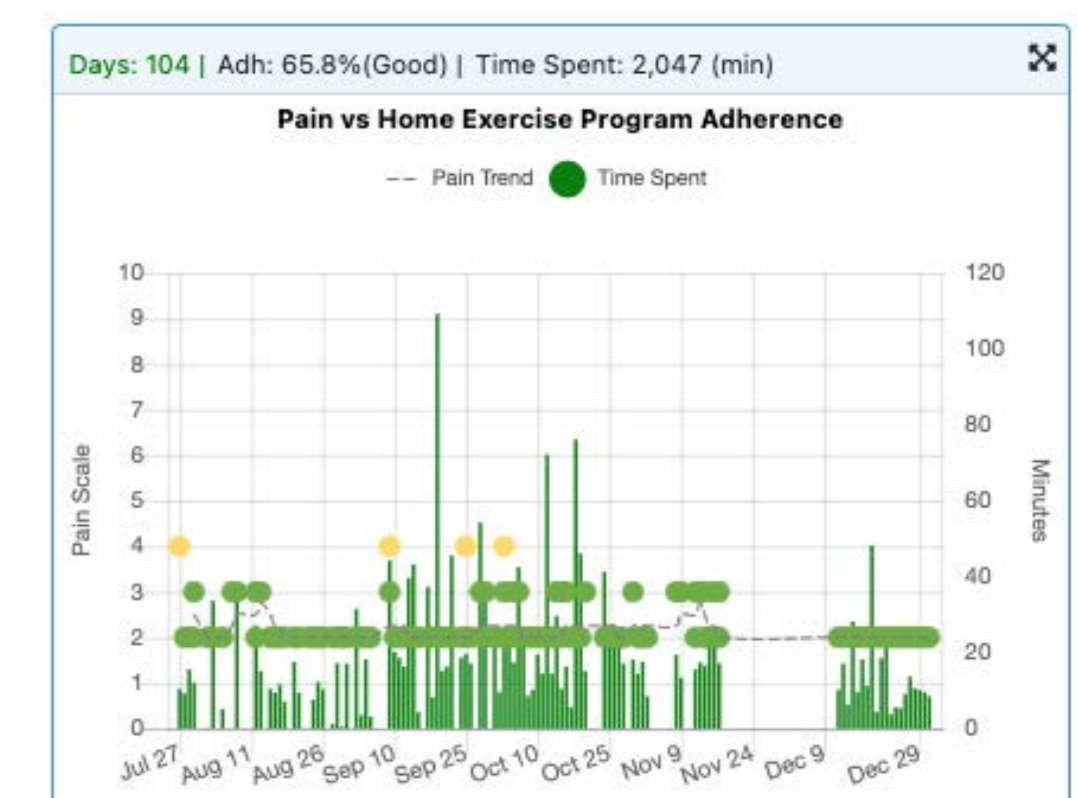
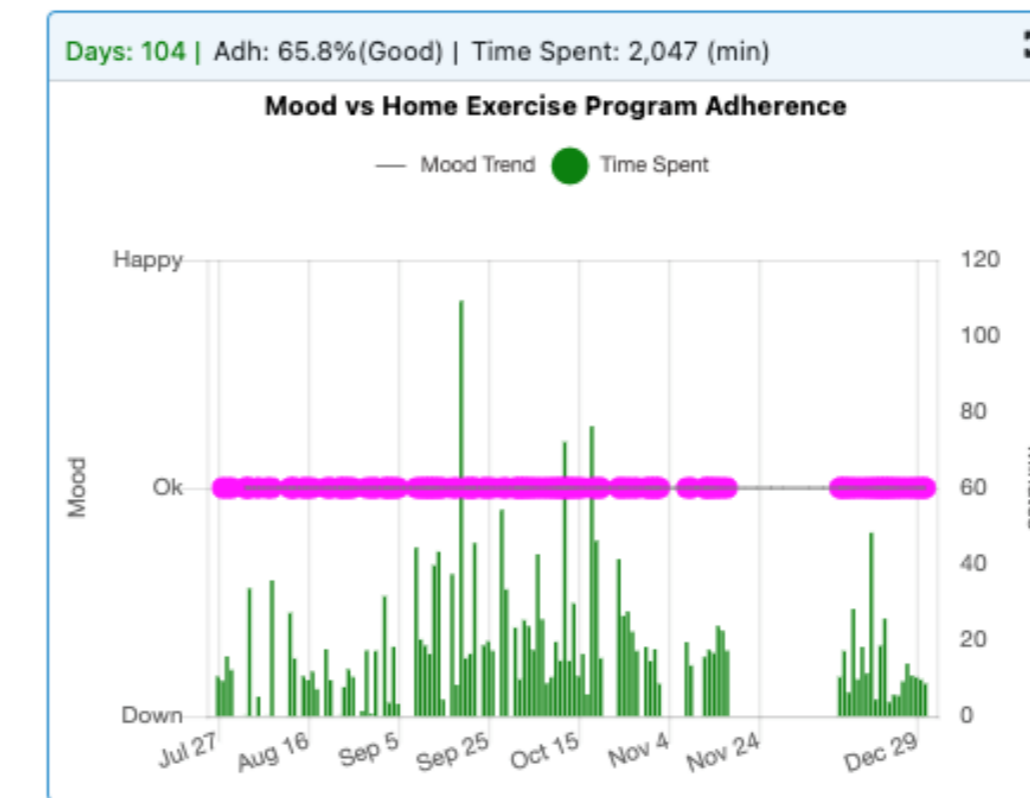
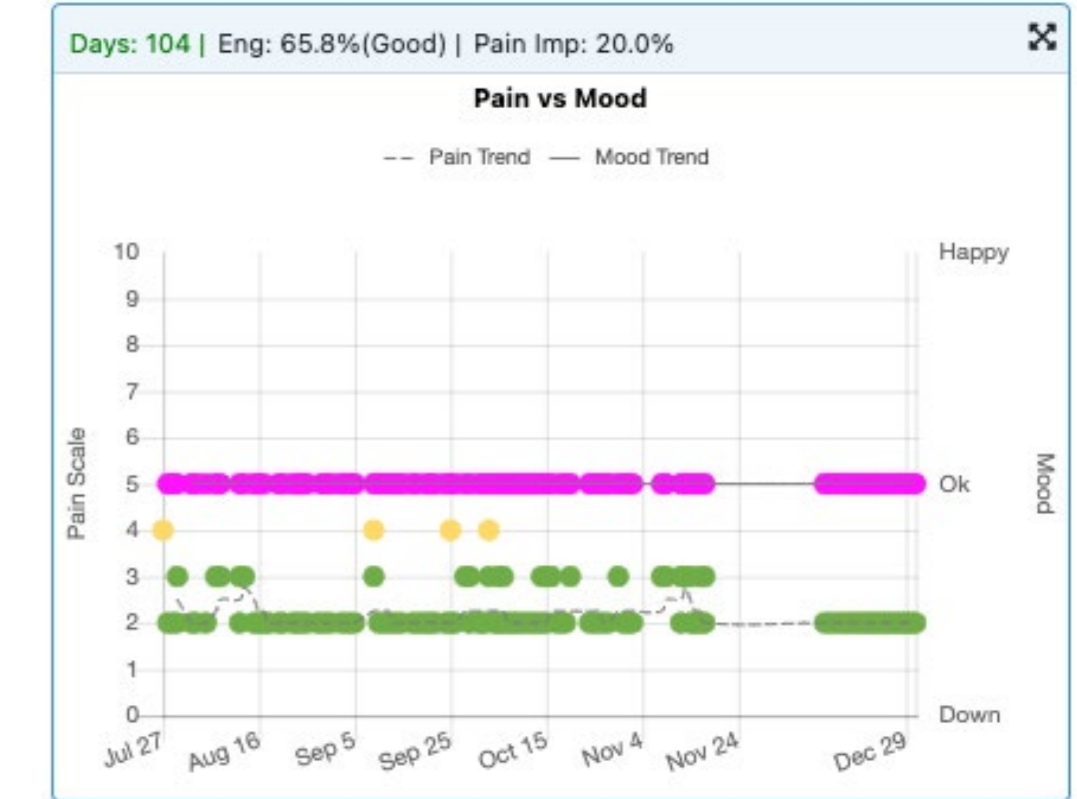
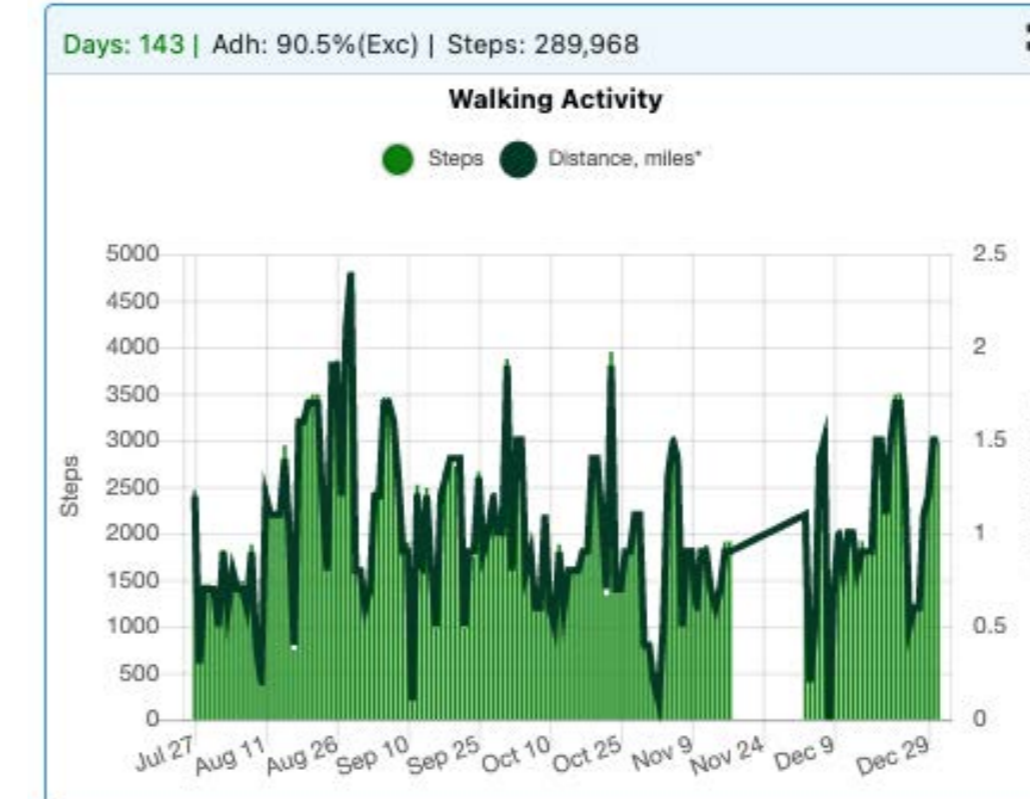
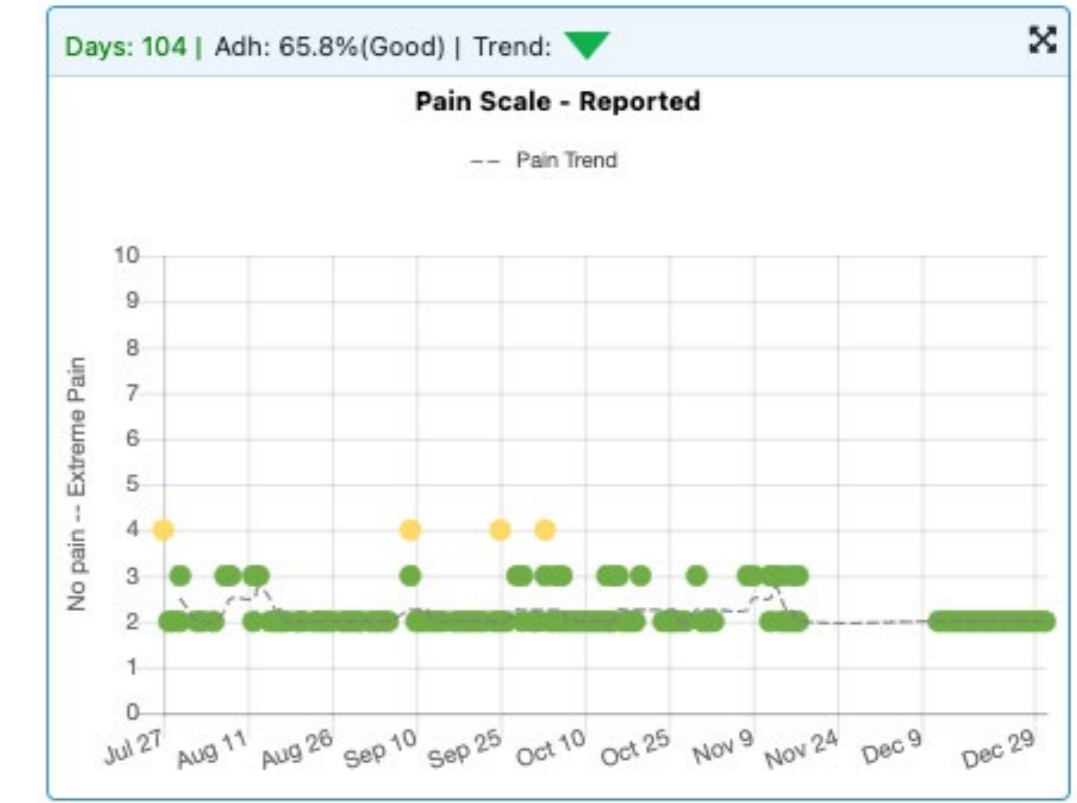
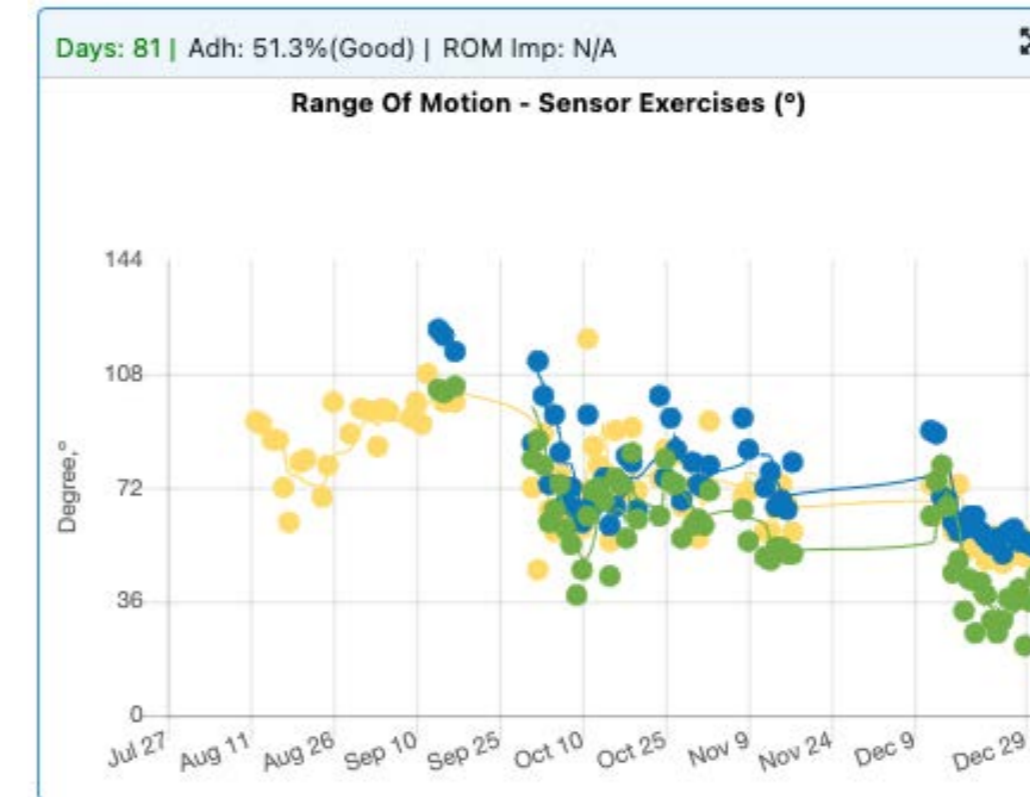
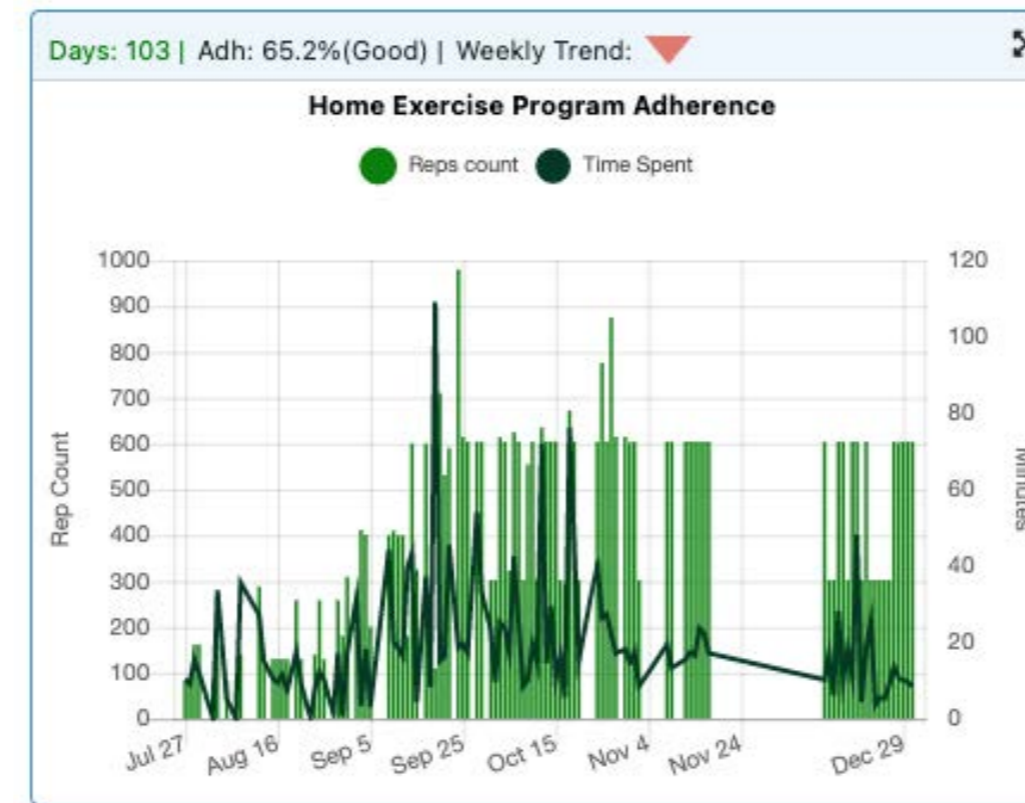
Reporting Period: 07/27/2022 – 12/29/2022
Date of Surgery: 05/25/22

History

Patient is a **67 year old female** with multiple injury episodes for the past 5+ years. She injured her right shoulder 3/20/2020 while cleaning. She had surgery on 5/25/22 - right shoulder rotator cuff repair, open biceps tenodesis, subacromial decompression, debridement. She had major restrictions - no overhead work, lifting limited to 5lbs.

Current Status

- She started using Recupe on 7/21/22 and has been consistent with her exercises.
- Her range of motion improved and her exercises have progressed from active assisted range of motion to resisted activities.
- She returned to work as of 10/4/22 and her pain has improved to 2/10.
- She continues to use Recupe for full recovery.



CAT Case

Reporting Period: 06/28/2022 – 12/31/2022

History

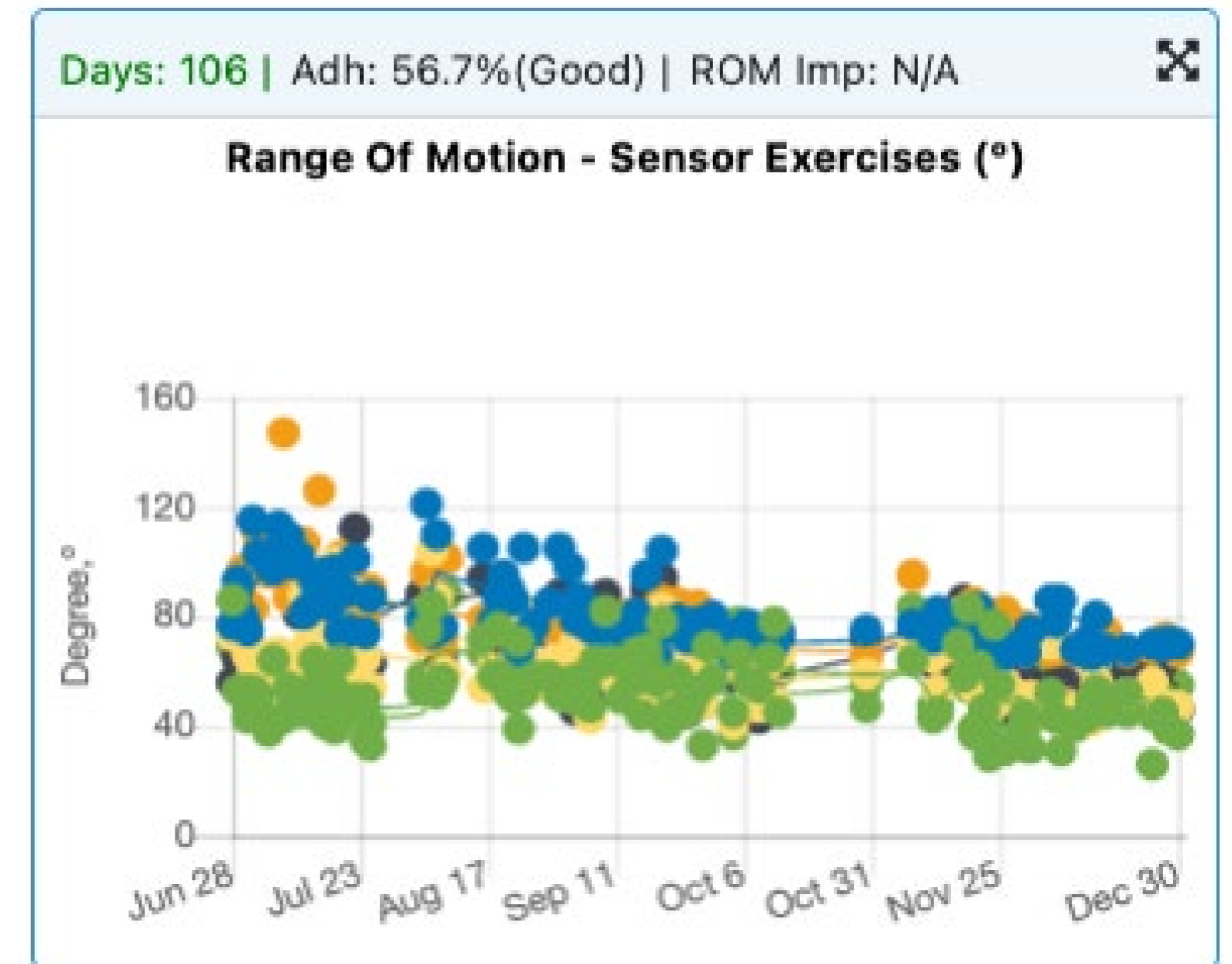
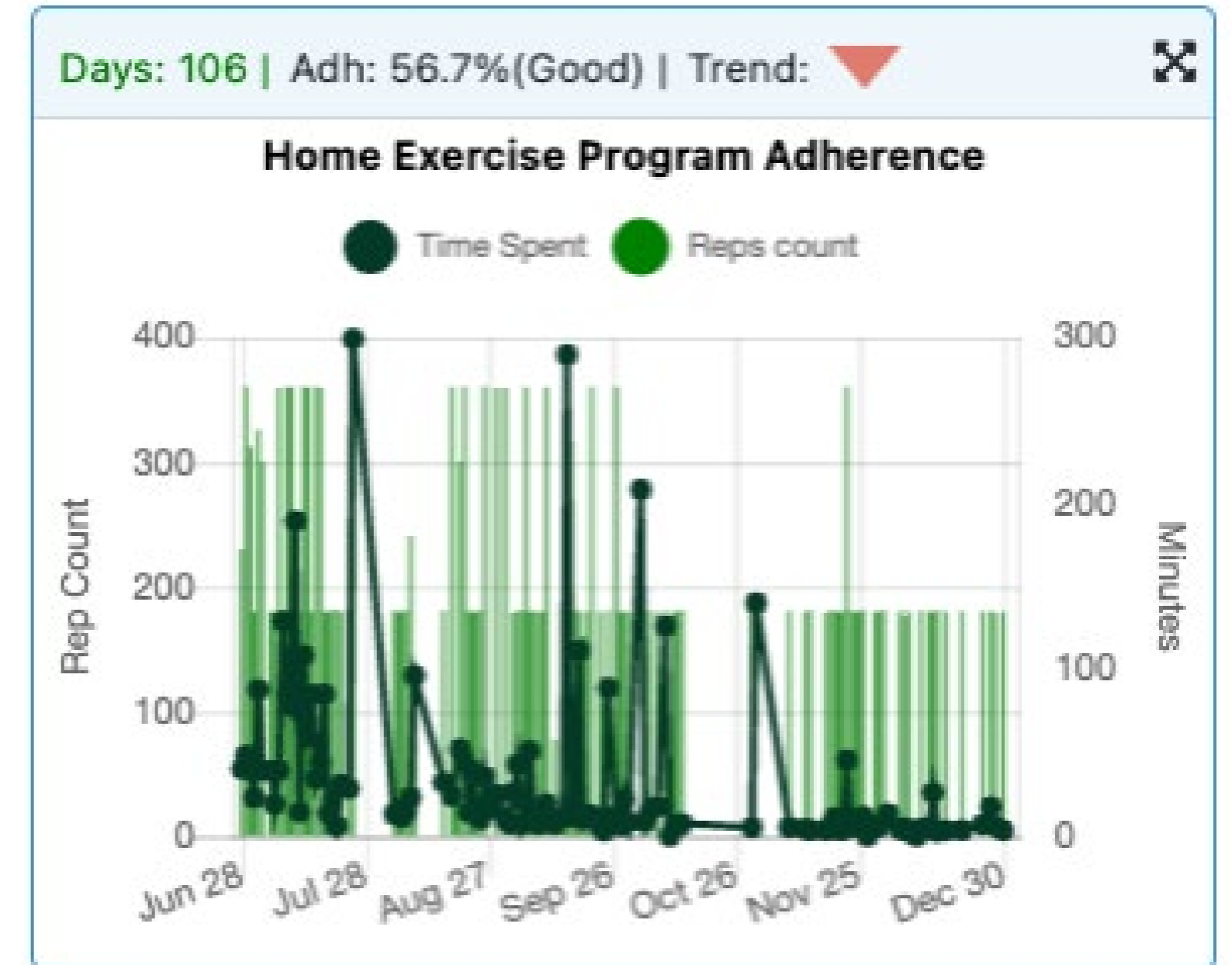
Patient is a **43 year old male** presenting with paraplegia from a complete spinal cord lesion at T2-6 from MVA in 2018. Comorbidities include morbid obesity, depressive episodes, MRSA infection, and multiple pressure wounds, managed by medical. Patient reports significant pain, co-managed with medical pain management.

Current Status

Injured Worker is currently active on Recupe and his home exercise plan continues. Range of motion has been consistent throughout treatment.

Power of Recupe Coach Coordination

- The injured worker (Cat Case) has been admitted to the hospital several times, such as for a UTI.
- Coach maintained contact with injured worker while admitted.
- Coach is the one who informs the case manager, claims adjuster, and care team about hospitalization.
- Once the injured worker was released, coach and physical therapist communicated with SNF staff and injured worker to ensure that injured worker returned to his Home Exercise Plan





About Plethy

Easy to follow musculoskeletal care programs for patients to follow at-home or on-the-go, between clinic visits



Clinically validated complete solution for all MSK conditions, for all joints



Delivers bio-psycho-social patient engagement



Analytics for quicker intervention and healthier recovery

Non-Surgical Patients | Conservative Care | Surgical Patients | Chronic Pain | Catastrophic Cases | Old Claim Cases

Question & Answers



Raja Sundaram, CEO | raja@plethy.com

CBS NEWS Segment on Plethy



UCSF Digital Health Awards - Oscars in Digital Health



Workers Comp writeup on Plethy. Click to read

