Modeling to Learn

Test. Don't guess.

Helping Care Teams Improve Implementation of Medication Assisted Therapies for Alcohol and Opioid Use Disorders

@LZPhD
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Office of Mental Health and Suicide Prevention
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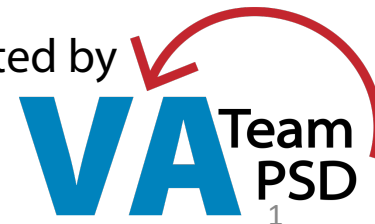
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Created by

VA Team PSD

1

Workshop Learning Objectives

Time	Workshop	Focus
1:00 PM – 2:30 PM	*Modeling to Learn (MTL)* **Helping Care Teams Improve Implementation of Medication Assisted Therapies for Alcohol and Opioid Use Disorders**	**mtl** mtl.how

1. Introduce principles of **systems science** that can be applied to improve **implementation** of evidence-based pharmacotherapy (EBPharm or MAT).

2. Describe why **participatory learning** from simulation improves team's decision-making related to MAT.

3. Demonstrate the **Medication Management (MM)** module of *MTL.*

4. Illustrate how simulation learning, using hyper-local team data, helps to identify the best way to **optimize local MAT implementation resources.**
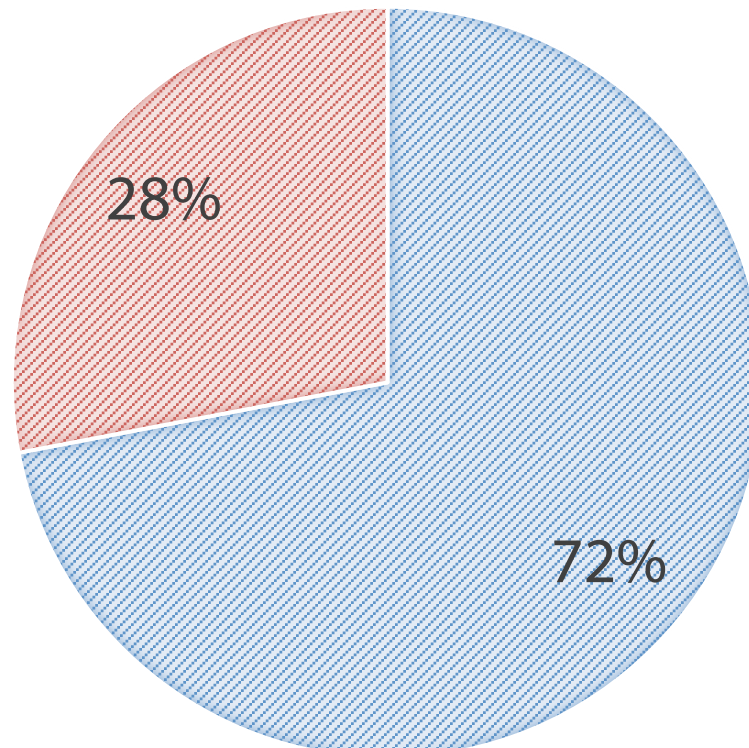
Team
Participatory System Dynamics

mtl.how/team

Facilitators

Key Partners

Workgroup Leads

Co-Investigators

The problem of EBP reach in teams:
How can we reach more patients with our highest quality care?

Other services   Evidence-based practices

28%

72%

*Source:* VA Strategic Analytics for Improvement and Learning, FY 2017

Veterans Health Administration
Model of a US National Health Care System

1. VA innovates with national dissemination efforts to train providers in evidence-based mental health practices

2. Enterprise-wide quality measures

3. Clinical practice guidelines and mandates for evidence-based care

4. National electronic health information system

5. Mental health care coordinated in multidisciplinary teams

What works to improve EBP reach, why, and under what conditions?
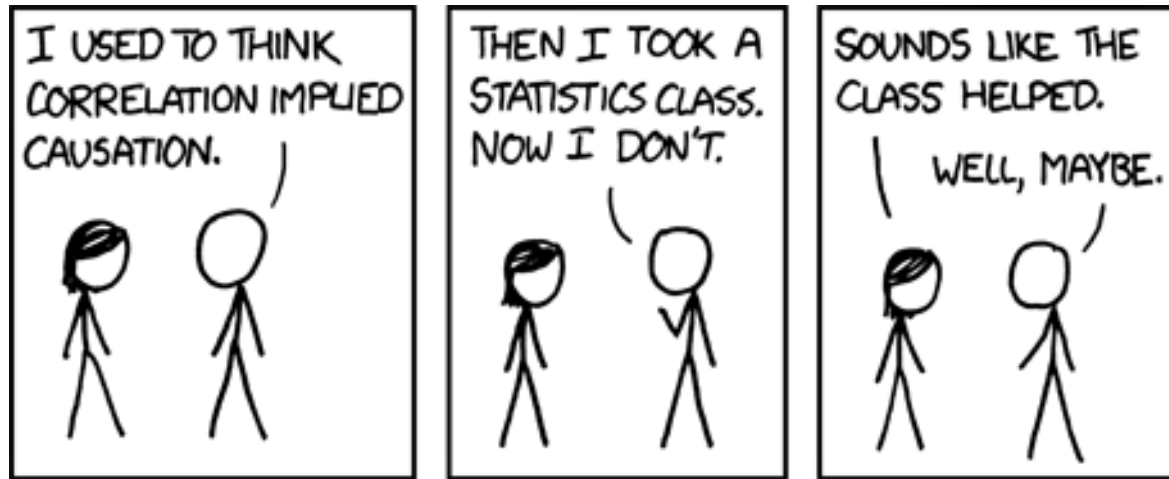
xkcd.com

Understanding causes of EBP reach, in local context, is critical to our stakeholders.

Our aims.

- develop a systems understanding of VA mental health services and the limited reach of evidence-based mental health care.

- empower mental health stakeholders to make locally optimized quality improvement decisions.

Target State: Lean SMART Goal

By April 2015, 40% of patients newly seen in outpatient mental health at Menlo Park for depression, PTSD, or anxiety disorders will have two psychotherapy visits completed within 28 days from time of intake assessment.

Specific.
Measurable.
Actionable: if never achieved morale may suffer.
Realistic: with the available resources.
Time frame: A due date.

Local clinic strategies are needed to address local differences.

Clinic 1	Clinic 2
3548 unique patients/year	2043 unique patients/year
Lower caseload per provider	Higher caseload per provider
Rare wait for initial appointment	Occasional waitlist to get into clinic
5.2 psychiatrists per 9 EBPsy providers	3.0 psychiatrists per 4 EBPsy providers
Higher EBPsy providers/MD ratio	Lower EBPsy provider/MD ratio
Higher EBPsy base rate	Higher EBPharm base rate
Providers often self refer for EBPs	Referrals to other providers by necessity
Multiple on-site specialty programs	Only telehealth specialty care
Training program site multiple disciplines	No trainees providing care
Most groups "open" (ongoing enrollment)	Most groups "closed" (infrequent opening)
Shorter time to next available appointment	Longer time to next available appointment

MTL focuses on learning among <u>frontline teams</u> making EBP-related care decisions.

Drawn from Hovmand 2014 & Scaccia et al., 2015

Scientific Model	Problem	Why problems persist
General Capacity	Learning	Stakeholders cannot or do not learn and adapt to their situation.
	Coordination	Conflict or lack of stakeholder consensus.
EBP Specific Capacity	Analysis	Policies are inconsistent with the real system constraints.
	Restructuring	The underlying structure of the system prevents workable solutions.

We define limited EBP reach among our patient population as a system behavior.

Other services Evidence-based practices

28%

72%
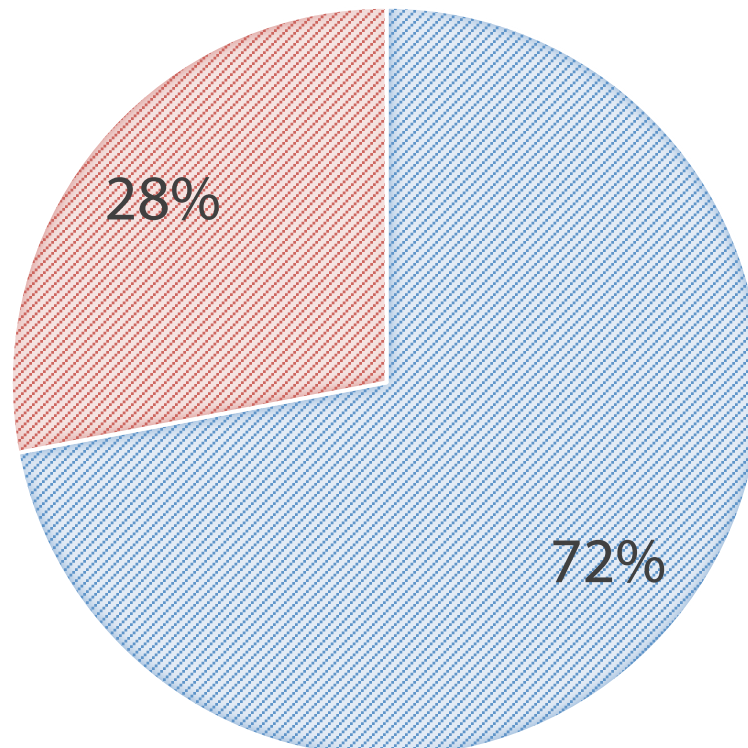
Source: VA Strategic Analytics for Improvement and Learning, FY 2017

Saturation achieved during structural behavioral validity testing.

Barlas, 1996

Direct Structure Tests
•Empirical
•Structure-confirmation
•Parameter-confirmation

Systems Theory Tests
•Structure-confirmation
•Parameter-confirmation
•Direct extreme-condition
•Dimensional consistency

Stakeholders & Literature
•Reviews and evaluations
•Exemplar SD Models

Structure-oriented Behavior Tests
•Extreme-condition test
•Behavior sensitivity test
•Modified-behavior prediction
•Boundary adequacy test
•Phase relationship test
•Qualitative features analysis
•Turing test

EBP Reach Behavior pattern tests

STRUCTURE

BEHAVIOR

OUR STAKEHOLDERS

National Center for PTSD

VA Employee Education Services

Office of Mental Health & Suicide Prevention

VA policy-makers, patients, and providers from psychiatry, psychology, social work, nursing & certified peer support specialists

Veteran Patients (VAPOR)

Office of Healthcare Transformation

Directors of Outpatient Mental Health & VISN MH Leads

Core Modeling Group of Frontline Staff

Frontline Teams

VAPOR introduces Modeling to Learn

https://mtl.how/intro
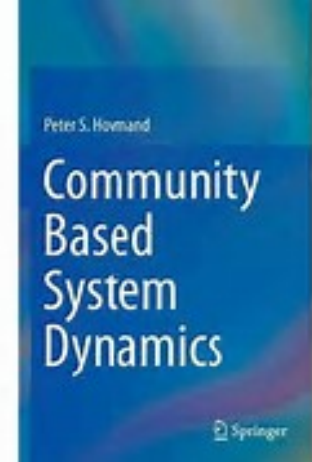
Our PSD approach – Participatory Research:

A partnership approach to research that equitably involves stakeholders in all aspects of the research process and in which all partners contribute expertise and share decision-making and ownership.

Hovmand, 2014; Oetzel et al., 2018

Participatory Research is an <u>epistemology</u>.

- Scientific inquiry that that actively considers the scope of current knowledge, its limits and validity.

- Participatory research asks, what knowledge is privileged or absent?

Modeling to Learn

Test don't guess.

ORIGINAL PAPER

Participatory System Dynamics Modeling: Increasing Stakeholder Engagement and Precision to Improve Implementation Planning in Systems

Lindsey Zimmerman[1,2] · David W. Lounsbury[3] · Craig S. Rosen[1,4] ·
Rachel Kimerling[1] · Jodie A. Trafton[4,5] · Steven E. Lindley[4,6]

Administration and Policy in Mental Health AND Mental Health Services Research

Volume 43 · Number 5 · September 2016

Springer

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Modeling to Learn

Test don't guess.

Virtual Facilitation

Transparent Local Data

Real-time Simulation

1. Equitable access to resources.
2. Mutual learning.
3. Shared decision-making.

Modeling to Learn
Theory of Change

Systems Thinking

mtl

Care Quality

Participatory Learning

MTL resources help teams look back two years and look ahead two years.

Data UI — What is. — 2 years ← Today → Sim UI — What if? — 2 years

Why is PSD effective?
Participatory learning to develop '*Systems Thinking.*'

"Staff" and "Time" costs as dynamics.

Causal mechanisms (dynamics) are made transparent for local learning.
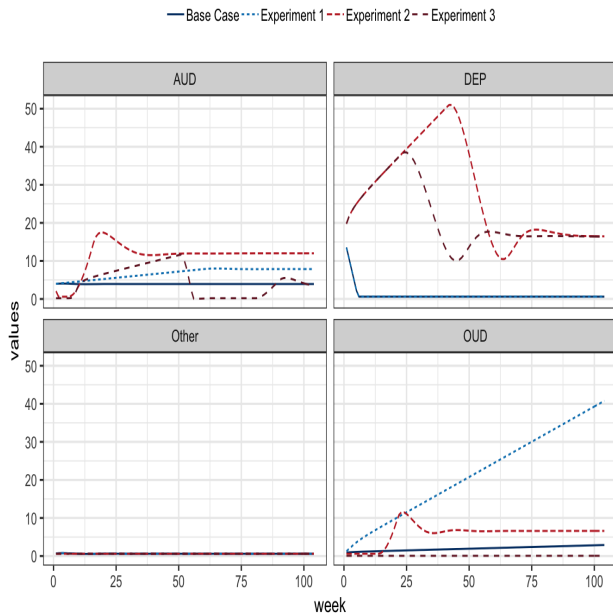

mtl.how/demo

MTL tools helps frontline staff find the best local changes faster.
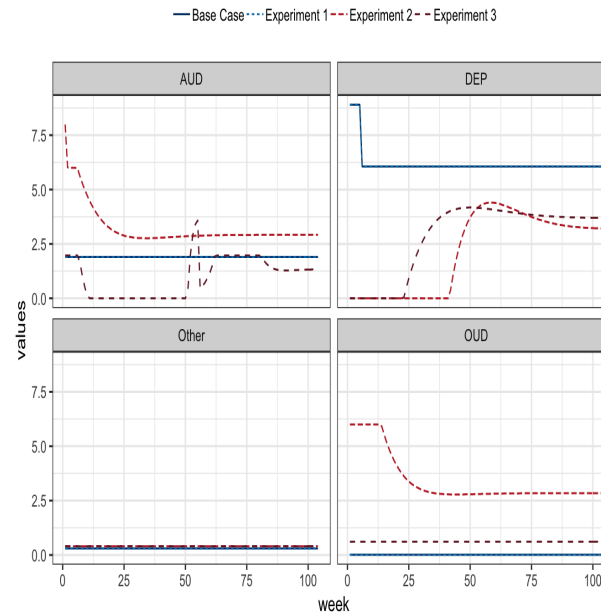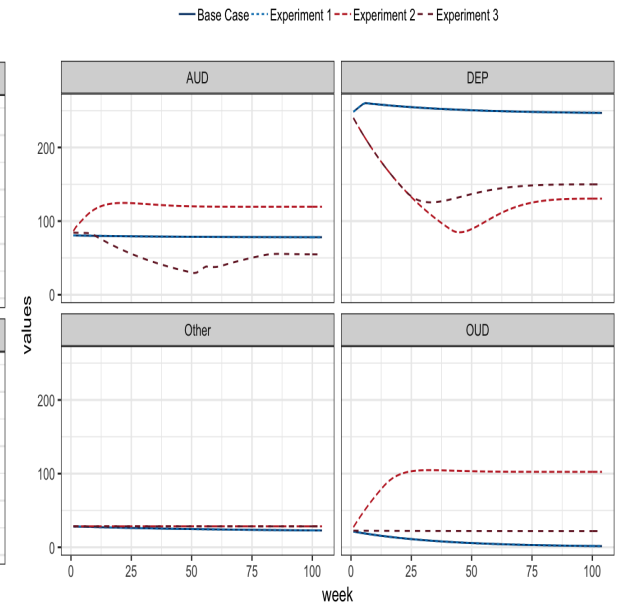
mtl.how

Compare Patient Cohort: Waiting to Start — Compare Patient Cohort: Starting Rate — Compare Patient Cohort: Patients in MM
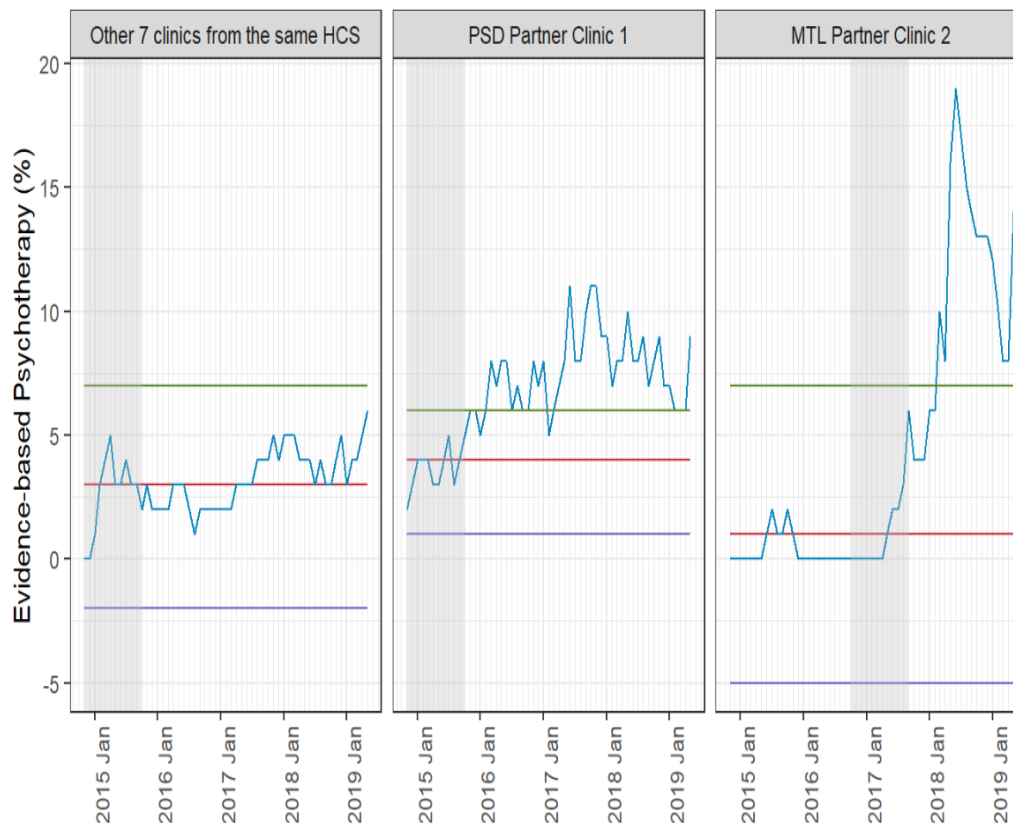
MTL shows whether things may get better
before worse or worse before better.

mtl.how

Is PSD/MTL effective for improving EBP reach? Strong signal in R21 pilot clinics.

— LCL (first year) — average (first year) — UCL (first year)

*HCS = Regional health care system

36 mos. sustained sig. improvement + 3 *SD* (α = .003)

20 mos. sustained sig. improvement + 3 *SD* (α = .003)

Key:

Green = Upper control limit (UCL)

Red = 12-month pre-PSD EBP proportion

Purple = Lower control limit (LCL)

SD = standard deviations

Modeling to Learn

Test don't guess.

Look before you leap.

Measure twice cut once.

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VA Team PSD

Team
Participatory System Dynamics

Principles of the open science movement:

- collaborative
- free and open
- transparent and reproducible science.

Modeling to Learn

Test. Don't guess.

Modeling to Learn Links

1. www.mtl.how/live - *Modeling to Learn* Live Sessions - Adobe Connect Room
2. www.mtl.how/data - Team Data User Interface - **Internal for VHA Providers Only
3. www.mtl.how/demo - Simulation Demonstration Self-Registration
4. www.mtl.how/sim - Simulation User Interface for Teams in *MTL Live*
5. www.mtl.how/menu - *Modeling to Learn* Menu - RedCap Survey of Team Needs/Priorities
6. www.mtl.how/facilitate - MTL Facilitator Dashboard at Forio Epicenter
7. www.mtl.how/github - This page - MTL GitHub Repository of Resources
8. www.mtl.how/video - MTL "How To" videos at YouTube
9. www.mtl.how/team - Team Participatory System Dynamics - The MTL Research & Development Team
10. www.mtl.how/lzim - MTL and Team PSD Lead - Lindsey Zimmerman, PhD
11. www.mtl.how/tms - VA TMS 2.0 Learning System for Accreditation
12. www.mtl.how/refs - MTL References
13. www.mtl.how/pubs - Publications & Presentations on MTL by Team PSD

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You can review *Modeling to Learn* session guides at
[mtl.how](mtl.how)

mtl

→ mtl.how

Session guides,
links, and
cheatsheets.

📁 mtl1.7_models	Update README.md
📁 mtl1.8_models	Update README.md
📁 session01	Update README.md
📁 session02	Update mtl_session02_see.md
📁 session03	Update mtl_session03_see.md
📁 session04	Add files via upload
📁 session05	Update mtl_session05_see.md
📁 session06	Update mtl_session06_see.md
📁 session07	Update mtl_session07_see.md
📁 session08	Update mtl_session08_see.md
📁 session09	Update mtl_session09_see.md
📁 session10	Update mtl_session10_see.md
📁 session11	Update mtl_session11_see.md
📁 session12	Add files via upload
📄 LICENSE	Initial commit
📄 README.md	Update README.md

![mtl Facilitate logo]

Participatory Learning to develop *Systems Thinking.*

MTL Fidelity Checklist for 12-session Plan

Sesson Summaries across *MTL* Modules

session 01. Today we're *modeling to learn* how to align our **team vision.**

session 02. Today we're *modeling to learn* how to check our **patient data** and **team trends.**

session 03. Today we're *modeling to learn* how to produce **team data** for simulation.

Partner
tt→

session 04. Today we're *modeling to learn* how to prioritize **team needs.**

session 05. Today we're *modeling to learn* how to log-in to our **team world.**

session 06. Today we're *modeling to learn* how to tell a **systems story.**

session 07. Today we're *modeling to learn* how to evaluate our **base case** of no new decisions.

Build
tt→

session 08. Today we're *modeling to learn* how to test a **dynamic hypothesis.**

session 09. Today we're *modeling to learn* how to **compare alternatives.**

session 10. Today we're *modeling to learn* how to use **systems thinking.**

Apply
tt→

session 11. Today we're *modeling to learn* how to make future **team decisions.**

31

session 12. Today we're *modeling to learn* how to turn **team learning** into a **team plan.**

We developed a secure website for reviewing team trends over time.

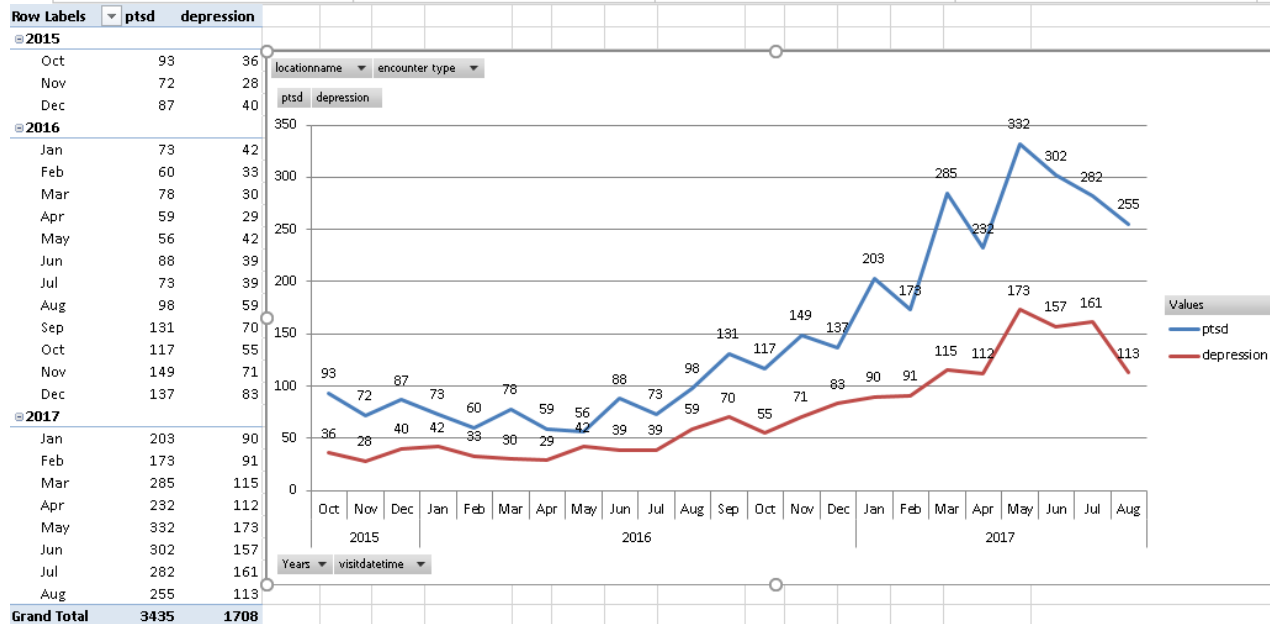# *MTL* resources help teams look back two years and look ahead two years.

Data UI
What is.
2 years

Today

Sim UI
What if?
2 years

Suicide Prevention - How to manage high risk patients.
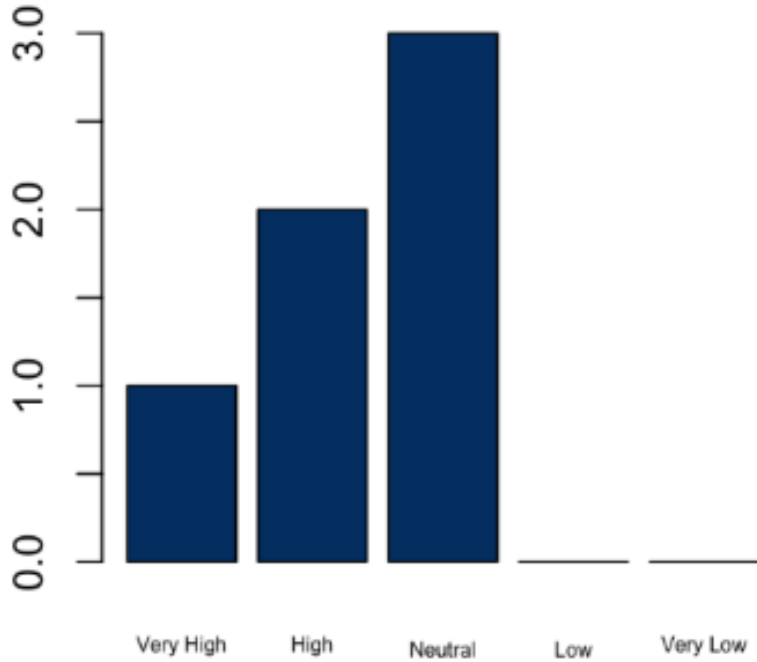
Stepped Care - How to decide when to step patients up to specialty care.

Session

Join Current Session ◉
Suicide Prevention -- Week 104
583ge_wl_bhip2_2019_04_14.xlsx

Play

Start a New Session
Care Coordination ○
Medication Management ○
Psychotherapy ○
Aggregate ○
Suicide Prevention ○

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mtl.how/menu

Why is *Modeling to Learn* effective?

Start a new Medication Management Session.

1. Review the team data and "i" information.
2. Zoom in/out to review system stories and complexity reveals for each care setting.
3. Run, examine the output, and save a base case of no new decisions.

Select an MM Learning Mode.

Learning Mode

Refer to the **Medication Management (MM)** tab of the **Team Data Table for Sim UI** at **mtl.how/data**, for data regarding the team's **New Patient Start Rates** and **Return-to-Clinic Intervals**.

◉ **Existing Patient Return-to-Clinic Visit Interval**

Choose this learning mode to prioritize the **Existing Patients Return-to-Clinic Visit Interval (RVI)** estimated from team data, and only start new patients in remaining open slots after the existing patient RVI, appointment supply, and missed appointments are all taken into account.

○ **New Patient Start Rate**

Choose this learning mode to prioritize the **New Patient Start Rate** estimated from team data, and only see existing patients in remaining open slots after the new patient start rate, appointment supply, and missed appointments are all taken into account.

❗ Starting a new simulation will stop the previous session for all team members. Session decisions and results may not have been saved.

[Start] [Cancel]

Modeling to Learn helps teams manage tradeoffs within existing staff resources.

If **Existing Patient RVI** is selected, then New Pt. Starts =

	AUD	DEP	OUD	Other
pts/wk	1.97	6.06	0.61	0.4

If **New Patient Start Rate** is selected, then RVI =

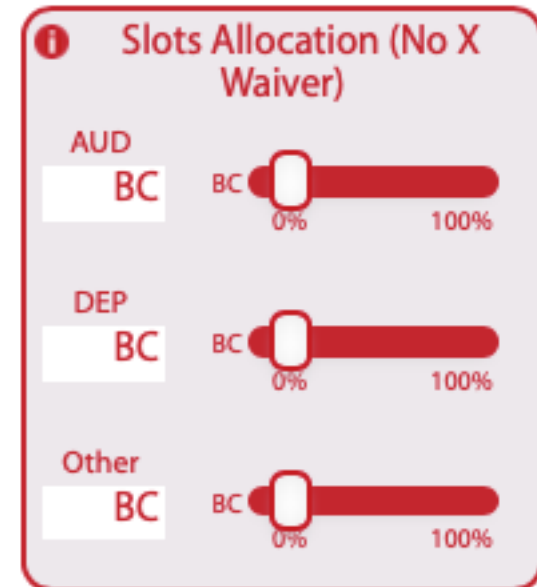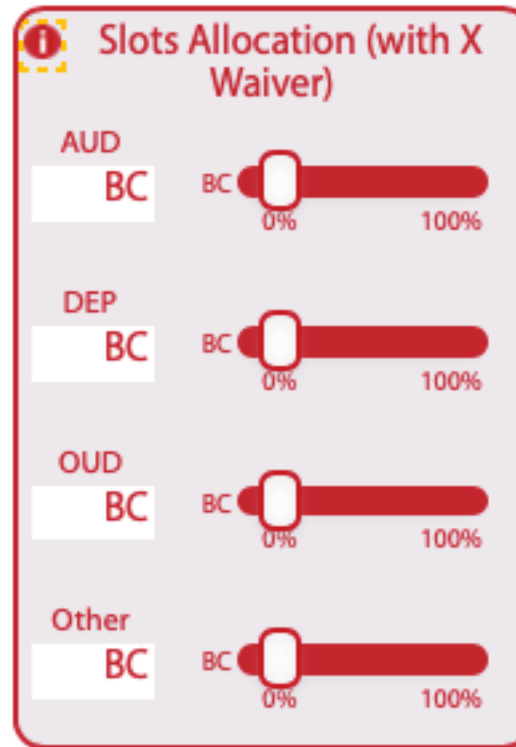|	AUD	DEP	OUD	Other
wks	10.47	23.42	0.11	9.56

Can we increase the number of patients with OUD that receive EBPharm without increasing wait-times for other patient needs?

Team Data

Appointment Supply (75th Percentile) (appt/wk)				60
Appointment Slots % (with X waiver)				50

	AUD	DEP	OUD	Other
Engagement Duration (median) (wks)	41	40.5	36	70.5
Return Visit Interval (median) (wks)	11	12	11	14
True Missed Appointment (%)	20	21	0	23
Start Rate (mean) (pts/wk)	1.9	8.9	0.01	0.3
New Patient Wait Time (median) (wks)	2	2.7	1.1	1.5
Slots Allocation % (with X waiver) (%)	16	71	10	3
Slots Allocation % (without X waiver) (%)	26	63	0	11

Learning Mode

Not all medication management staff resources are the same.

Team Question: Can we increase the number of patients with OUD that receive EBPharm without increasing wait-times for other patient needs?

Outputs — samplefile.xls — ‹BACK

Medication Management

Our Question
Briefly describe what your team wants to learn from this experiment.

If we get an increase in opioid use disorder referrals, will it increase the wait-time for ①

Save Copy Export

Calendar - Week 02

0   010

Advance
End ▼ Wks

Our Hypothesis
Outline the systems story your team believes will cause the outcomes your team expects to observe.
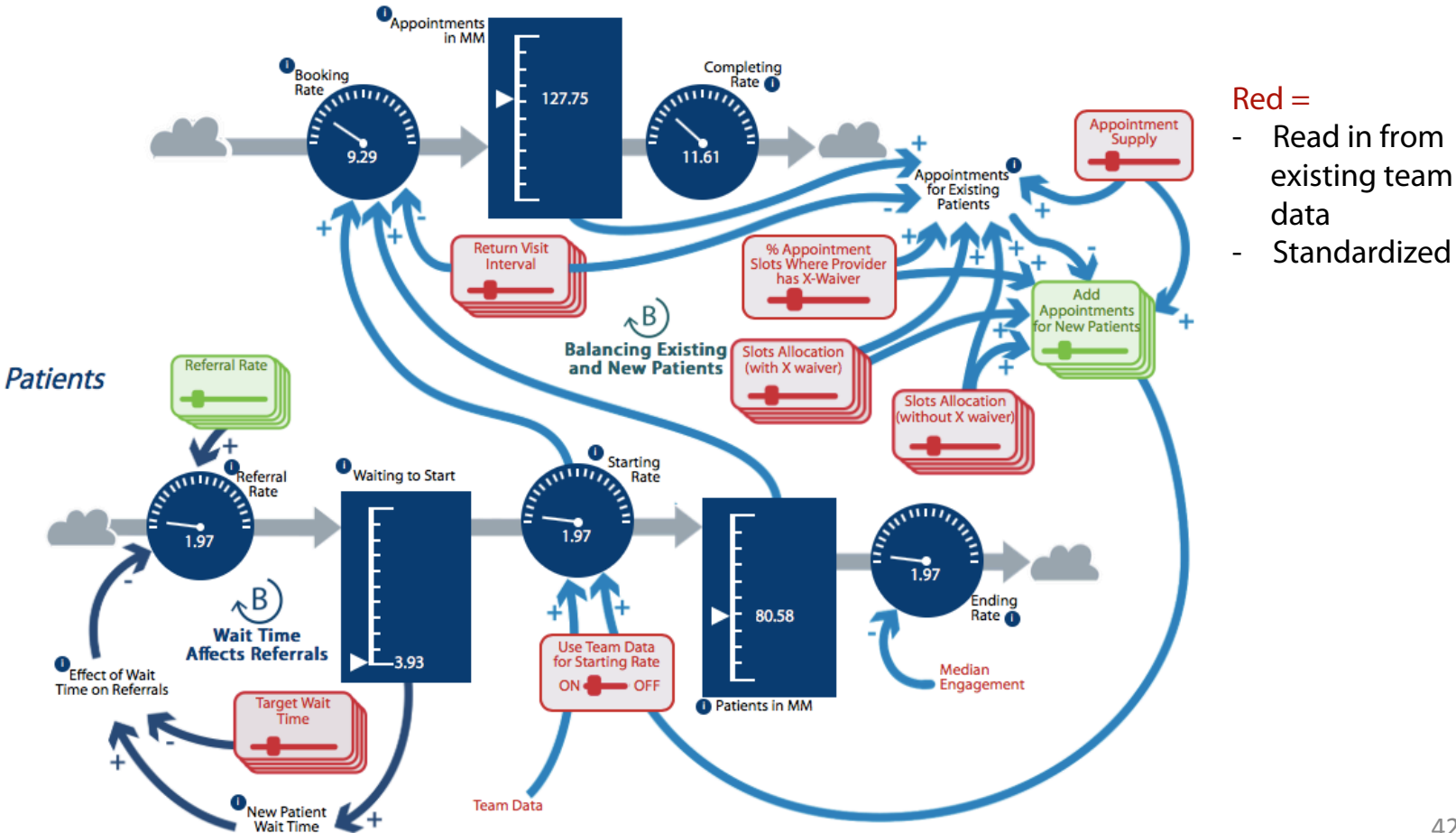
Our Findings
Describe your team's findings, insights and conclusions from this experiment.

Our Decisions
Based on what was learned in this experiment, what changes is the team ready to make in their practice?
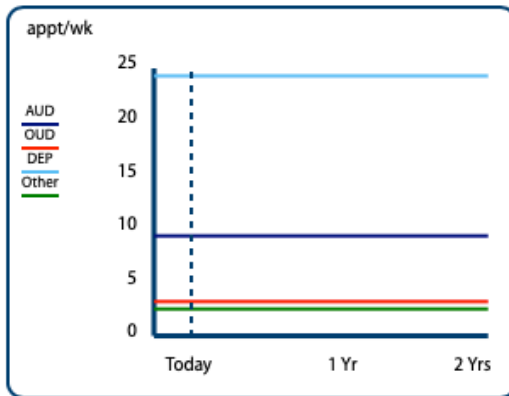
Hypothesis: If we make no new decisions in our team, then…
1. we will continue to underserve patient in our community who may benefit from OUD EBPharm, and
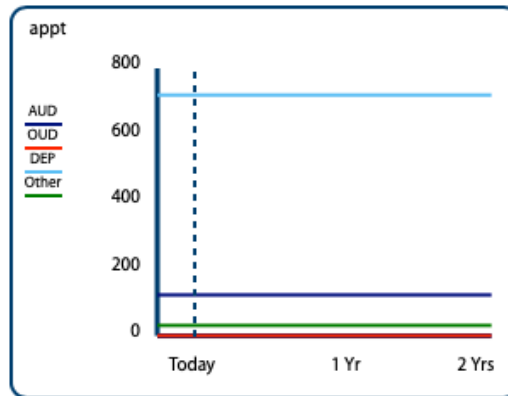2. we won't help as many patients toward recovery as we would like.
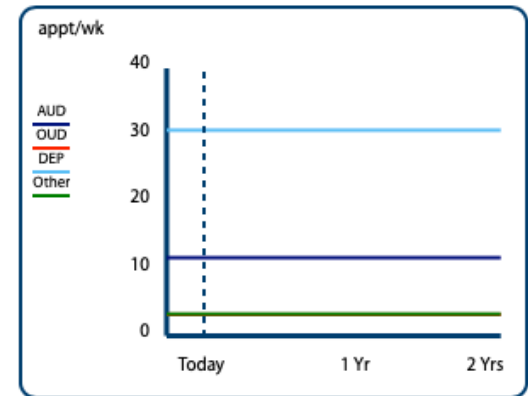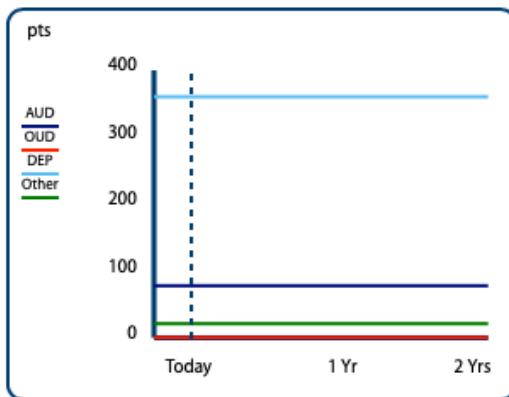

Red =
- Read in from existing team data
- Standardized

What if we made no new decisions?

Basecase

Findings: If we make no new decisions, then…

1. we continue to primarily serve patients with depression
2. all patients come back every 10-11 weeks
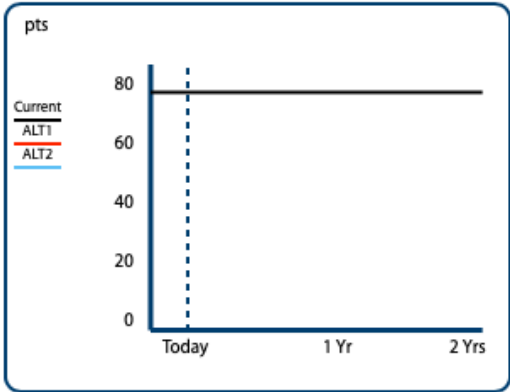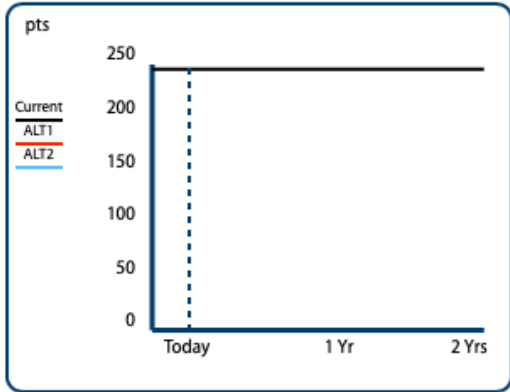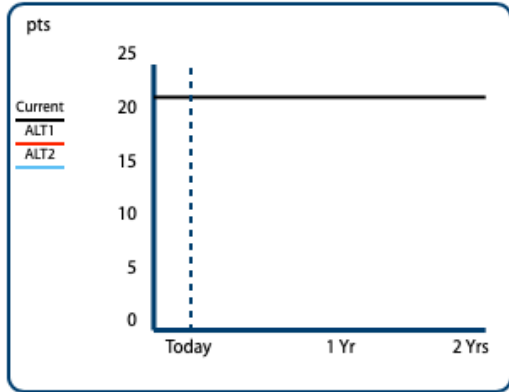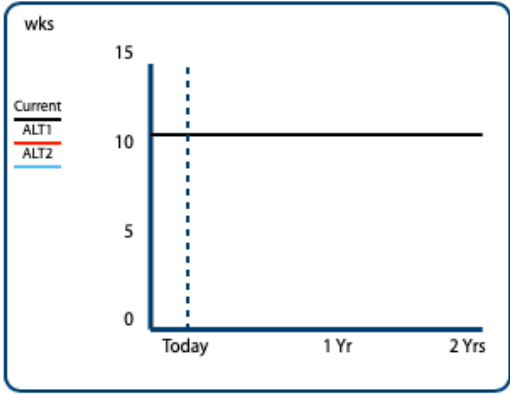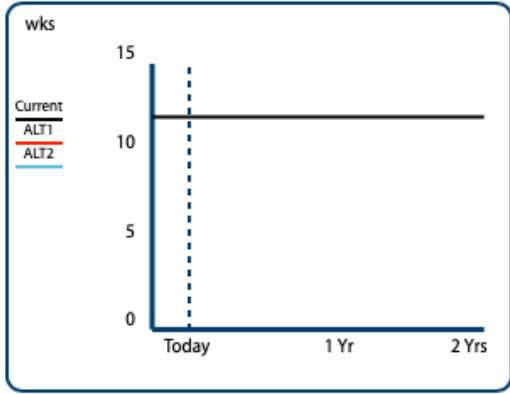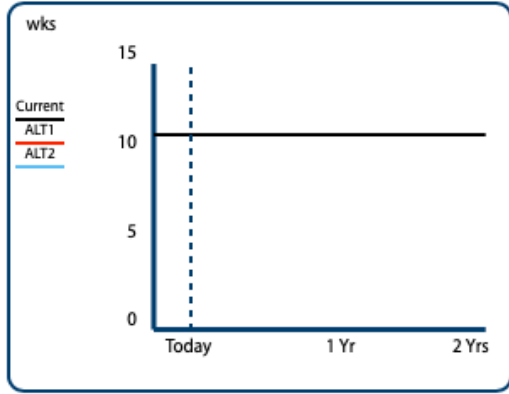
Hypothesis about Re-allocating X-waiver slots:

- we could start more patients with OUD on EBPharm
- but we expect more patients with depression and AUD will be waiting to start than in the base case.

Red =
- Read in from existing team data
- Standardized
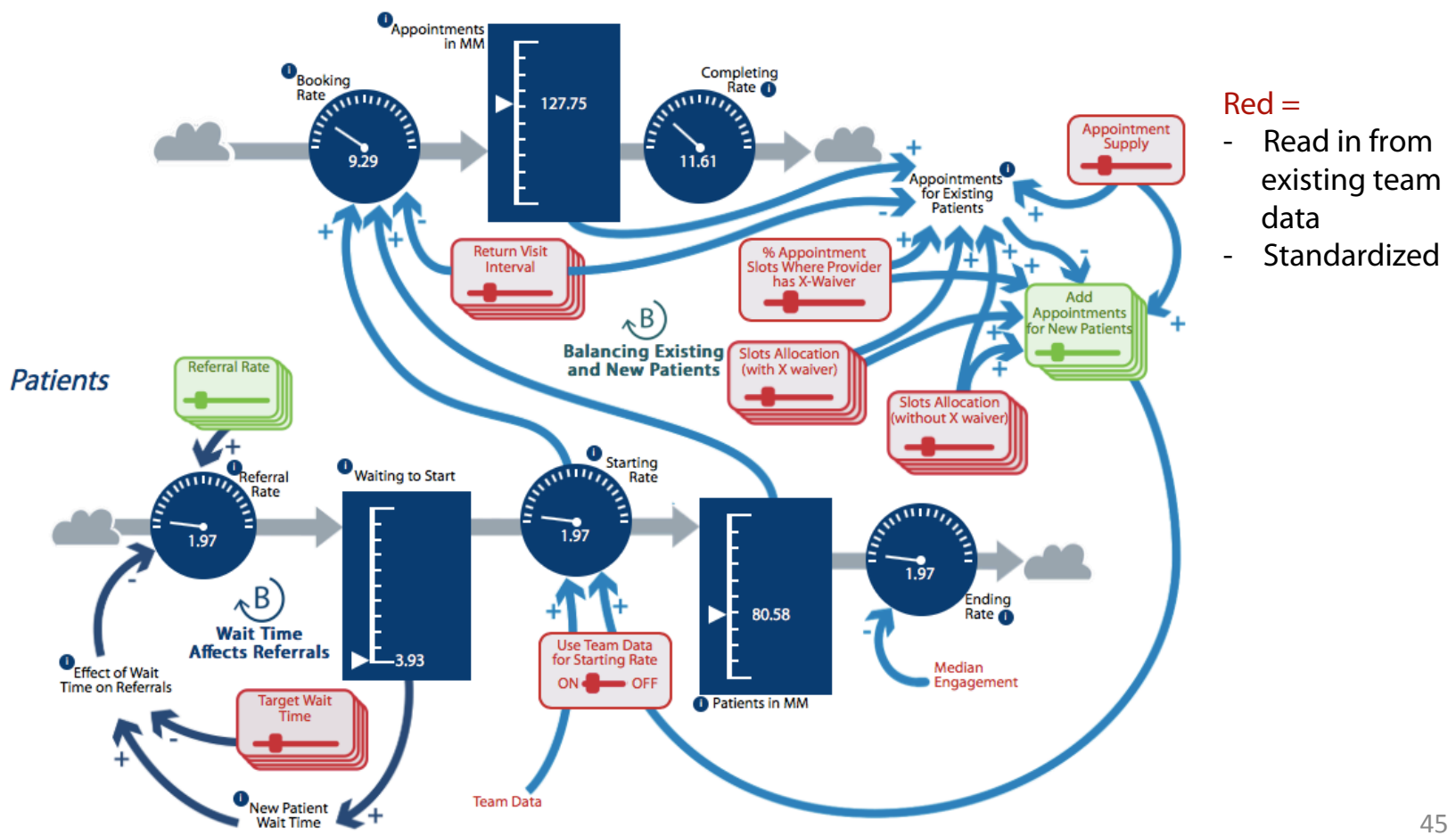
Re-allocating 20% of x-waivered slots from patients w/ depression to patients w/OUD levels out over time.

With two new referrals each week we can triple the number of patients with OUD in our team who receive EBPharm over the next two years.
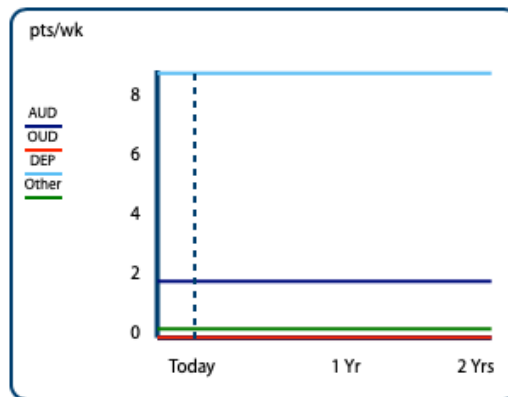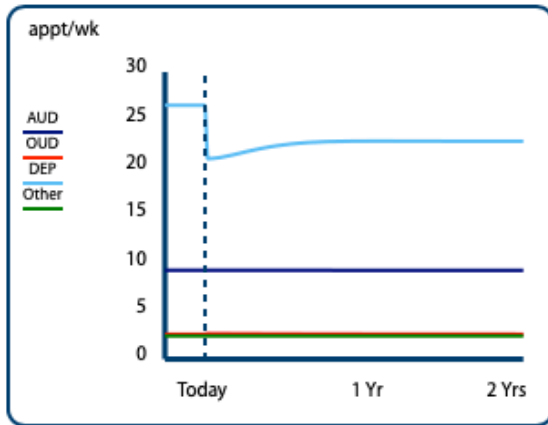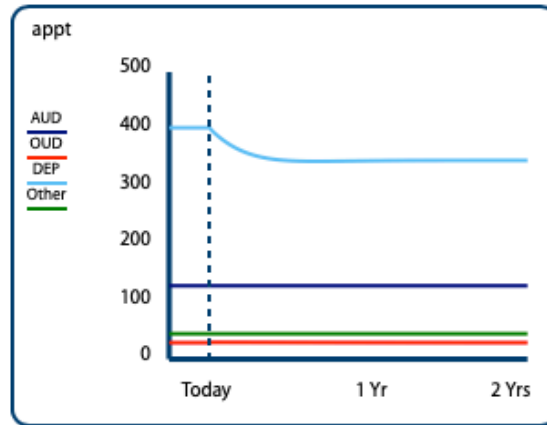

|	
▼ Booking Rate	▼ Appointments in MM
▼ Completing Rate	▼ Patients in MM
▼ Start Rate	▼ Waiting to Start
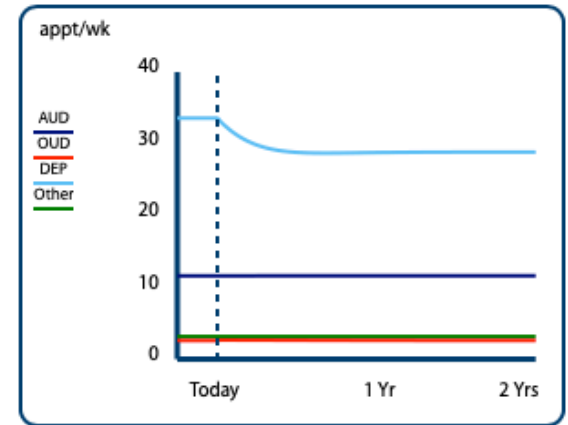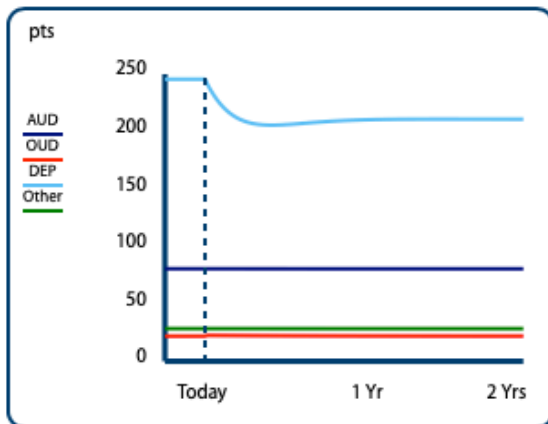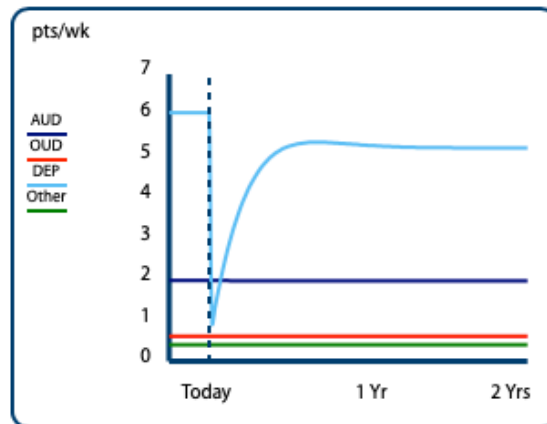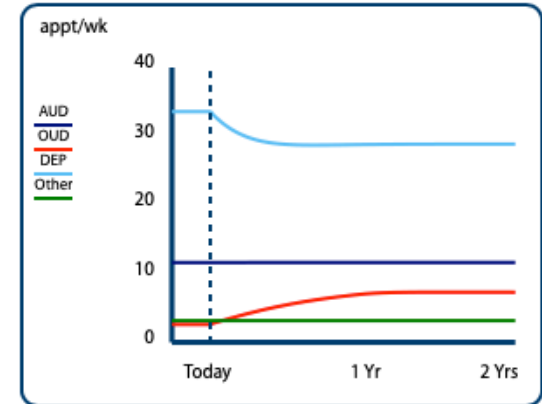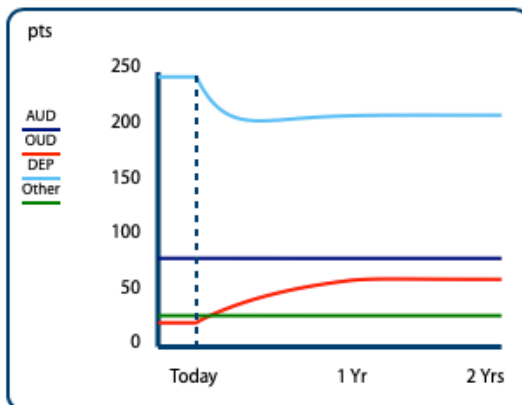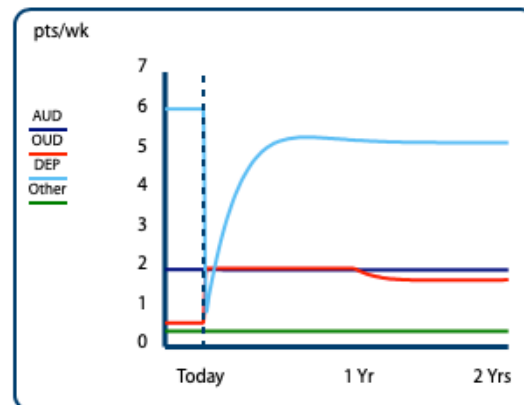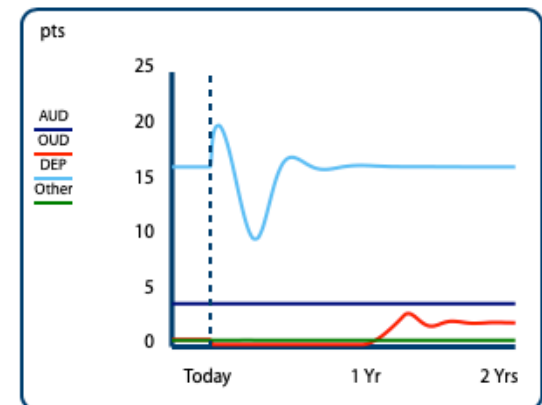
MTL focuses on improving <u>systems thinking</u> among frontline teams making care decisions.

Systems Thinking	Definition
Complex	Forest not trees. Relationships among two or more variables (wait times, improvement rate), or two or more settings (primary care, general mental health).
Feedback	Loop not line. Not simple cause and effect. The end of the story often influences the beginning, and is strengthened (reinforcing) or reduced (balancing) around the loop.
System Behavior	Movie not snapshot. Trends over time. Systems cause their own behavior through feedback.
Time	Short *and* long term. Better understanding of change over time (e.g., worse before better, better before worse).

Decisions based on *Modeling to Learn* experiments:

Something that we think is outside of our control may actually be the accumulated result of our own decisions.

Team
Participatory System Dynamics
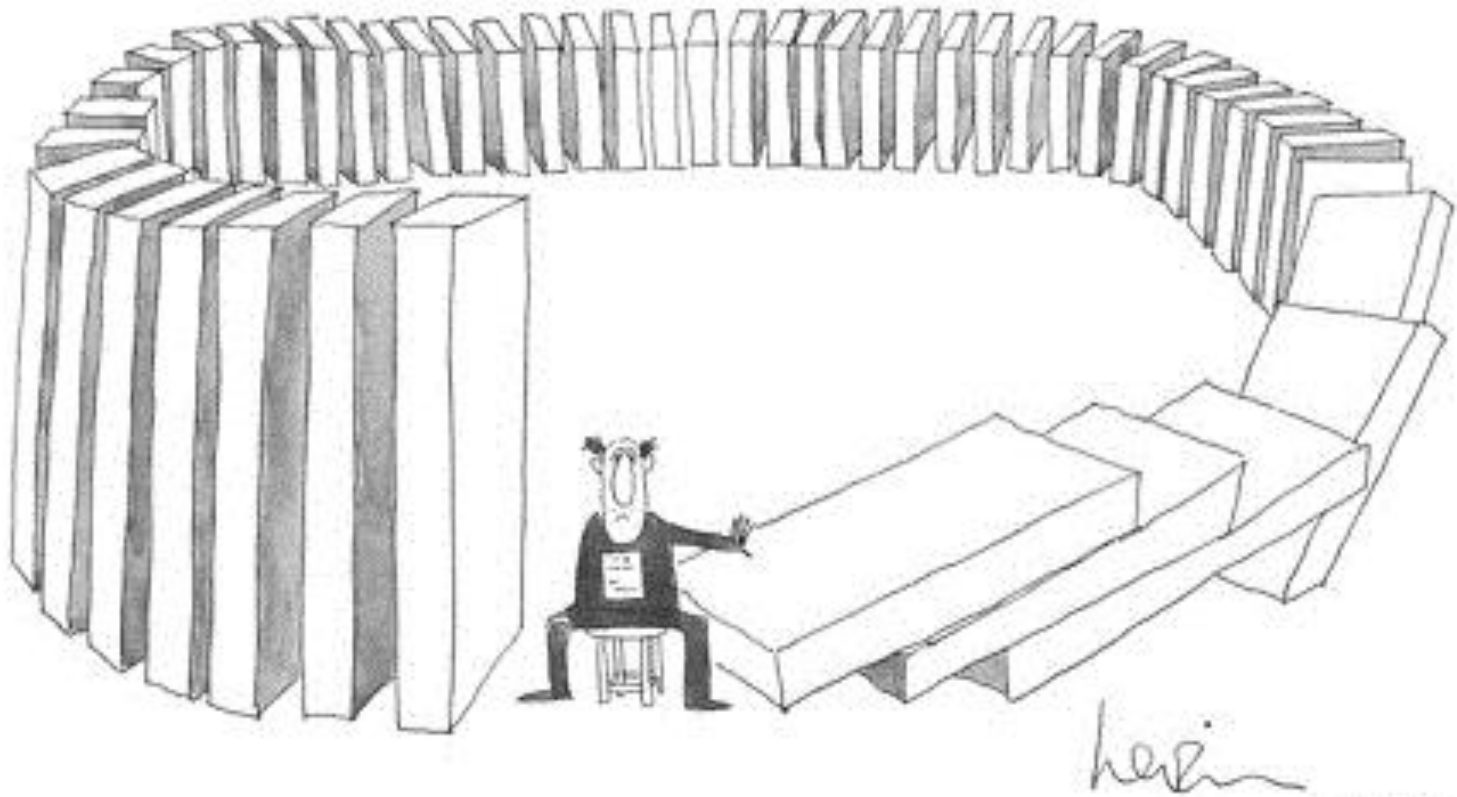
R21 Co-Investigators
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Project Support
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Team PSD Mentees
Cora Bernard, MS, Swap Mushiana, MS, Joyce Yang, PhD

VAPOR (Veteran VA Consumer) Board
DC Barlow, Ren Kramer & Erik Ontiveros

Georgia Health Policy Center
Jane Branscomb, MPH Debra Kibbe, MS Ursula Davis, MA, Amanda Martinez, MPH

Takouba LLC
Col. (Ret.) James Rollins, MEd

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Office of Mental Health and Suicide Prevention (10NC5)
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mtl.how/team

Resources and Help

mtl
mtl.how

Session guides, links, and cheatsheets.

mtl
mtl.how/demo

Self-registration for simulation demo.
Course code: ahsr2019

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Download 1-page *Modeling to Learn* Cheatsheets at
mtl.how

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mtl.how/data — Data UI Cheatsheet (Updated 2019_05_09)

Learning Objectives

Modeling to Learn
Test. Don't guess.

MTL objectives include activities and competencies that…
1. Are meaning for you and align your learning goals with your team.
2. Develop systems thinking skills to help you see how several things fit together, and understand causes hard to see without data and modeling resources.
3. Make VA data, initiatives, and standards transparent to you.
4. Empower you to realize ongoing improvements in team quality of care & work life.

Timesavers

1. Explore trends on SplashPage
2. Use most recent data_ui file
3. Save a team_data_sim_ui file w/ preferred filters

mtl.how/data

Login: Open mtl.how/data from Internet Explorer. Select VISN & Facility

1. Click on facility # at top left for larger view of splashpage
2. Use arrows & funnels to filter by location, grids, etc.
3. Click on View dropdown to switch between different charts and tables

You can see all of your station's files at the bottom of the page. You can manipulate the chart below to see facility-level information.

Note: Splashpages typically show 2 years of prior data, but if your facility is too large, it will only show 1 year.

Data UI

1) Find data_ui folder
2) Open most recent data_ui file using Excel Workbook not web app.
3) Click on "Control" sheet. Choose 3 digit station # from dropdown. Click "Get Clinic List"

4) Choose grids by clinic names, location, etc. Click on arrow in Column B to add grids to Column A. Make Column B wider to the right for hidden grids
Note: "ZZ" Clinic Names = Deactivated clinics

5) Choose a) "Get Patient-level Data"" (shows data derived from charting) or b) Choose module & "Create Team Data table for Sim UI" (shows parameters for each module from team data)"

6) Explore different tabs in the file saved.
Note: Restricted Patients = Patient identifiers asterisked out w/ last initial & last 4 of SSN in Column H.

To Save: Click on Browse & Save. This will automatically save back to the SharePointSave file to 1) data_ui or 2) team_data_sim_ui folder by clicking on BrowseAdd team name (facility # & date will auto-populate).
Note: This is PHI. Save back to SharePoint or PHI-safe places. Encrypt for emails.

Acronyms

AGG: Aggregate
CC: Care Coordination
Count: Aggregate Data for Viz
Diag: Diagnostic data
Data: Sortable report of data
Enc: Encounter types of visits
HF: Health Factors data of visits
Meas: Measures or flag names
MM: Medication Management
MTL: Modeling to Learn
PSD: Participatory System Dynamics
PSY: Psychotherapy
SP: Suicide Prevention
UI: User Interface
Viz: Visualization of trends

Troubleshooting

- Missing data? Check filters at top of columns or legends
- PivotTable refresh error? Click on Data tab & Refresh

Modeling to Learn (MTL) is an ongoing quality improvement project by VA Team Participatory System Dynamics. Info: mtl.info @va.gov Updated 2019_05_09

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mtl.how/sim — Sim UI Cheatsheet (Updated 2019_05_09)

Learning Objectives

Modeling to Learn
Test. Don't guess.

MTL objectives include activities and competencies that…
1. Are meaning for you and align your learning goals with your team.
2. Develop systems thinking skills to help you see how several things fit together, and understand causes hard to see without data and modeling resources.
3. Make VA data, initiatives, and standards transparent to you.
4. Empower you to realize ongoing improvements in team quality of care and team quality of work life.

Login

1. Open mtl.how/sim in Chrome. Use lowercase for username (VA email) & password
2. Choose team world for experimenting as a team -or- individual (ind) world for learning on your own

Home

1. Team Name (team world) or Your Name (ind world)
2. Navigation Menu - Home: You are here!
- Play: Run experiments
- Chat: Chat w/ team or facilitator
- Help: MTL sim resources
- Logoff: Always logoff via button
3. Your Name & Photo - To add your image: Create gravatar.com account w/ VA email & upload photo

4. Session
- Join Current Session: Click on circle & Play
- Start New Session: Choose new module, select Team Data, & Play

Note: For CC & MM modules: choose Learning Mode

Learning Mode

Existing Patient Return-to-clinic Visit Interval

New Patient Start mode

5. Experiment Maintenance**
- Delete incorrect runs
- Rename runs as necessary
- Export ≤10 runs in Excel file

6. Team Data Menu Maintenance**
- Delete old files
- Rename incorrect files
- Add files: Copy + paste team_data_sim_ui file name from mtl.how/data

** Panels 5 & 6 are only visible for individual worlds or team leads in team worlds, and are NOT available in mtl.how/demo mode

Play

1. Module name
2. Team data uploaded for current sim
3. Experiment Timeline
Run experiment for 0-2yrs & show feedback stories.

4. Outputs & Text
View ≤6 variable trends overtime. Click on expand icon for full functions.

5. Experiments
- Select any previous run to set experimental sliders & Q/H/F/D text to that run.
- Team data table shows starting values for variables from your data.
- Move sliders from initial values to test a hypothesis.

6. Text
Enter Question, Hypothesis, Findings, & Decisions text. Click on expand icon in blue bar for full functions.

Our Question
Our Hypothesis
Our Findings
Our Decisions

Troubleshooting

- Questions on variables? Click on "i" icon for variable info or "BC" for basecase values.
- Data not loading? Make sure .xlsx extension is included. - Rendering issues? Log-off completely and log back in.
- What do the colors means? Red means read in from team data. Green is for experiments that are important that we do not have enough data for. Purple is for experiments on sensitivity.
- Questions? Visit Help page on the Sim UI at mtl.how/sim or visit mtl.how.

Modeling to Learn (MTL) is an ongoing quality improvement project by VA Team Participatory System Dynamics. Info: mtl.info @va.gov. Updated 2019/05/09

You can check out our
demonstration simulation website.

mtl
mtl.how

Session guides,
links, and
cheatsheets.

mtl
mtl.how/demo

Self-register
Course Code: ahsr2019

Run Your Test

Click the icon to run your own simulation.

Run

Please provide some information so we can send you a login

Please note that your name, email and password will only be used to create your login credentials. You will have access to the simulation for 5 days, unless you were given a Course Code. Unless you choose to continue to receive updates about the Modeling to Learn program, the system will erase your information after 5 days.

*First Name?

*Last Name?

*Your email?

*Create a Password?

*Confirm your password?

*Your Institution?   Please select

If other please specify >

*Your Role?   Please select

If other please specify >

*Your Discipline?   Please select

If other please specify >

*How did you find us?   Please select

If other please specify >

Enter your course code >

You do not need a course code. However, some users may have course codes for specific trainings.

Yes   No

Would you like email updates about *Modeling to Learn* quick tips and new releases?

Run

mtl

mtl.how/demo

mtl

mtl.how/demo

*Once registered go to:
mtl.how/demo_login

Help is available in top navigation bar.
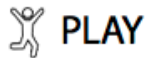
Model Diagram	Experiment Timeline	Outputs	Experiment
The blue header at the top shows the module and data file chosen. The rates (circles) and stocks (rectangles) update dynamically with changes in the experiment variables. Throughout the model diagram, there are "I" icons to explain how the variable is calculated.	Use reveal complexities to look at balancing and reinforcing feedback systems stories. In the systems stories, there are two kinds of arrows. Plus signs mean trends move in the same direction. Minus signs mean trends move in the opposite direction.	View trends over time for ≤6 variables **Text or Q/H/F/D** Enter Question, Hypothesis, Findings, and Decisions text for each experiment. **Expanded Outputs** View Q/H/F/D Text and Results Dashboard at once Expand **Results Dashboard** View trends over time for ≤6 variables. Compare ≤2 experiments against current run.	**Select Experiment** Select previous experiments to cue up experiment values and q/h/f/d text from previous experiments. **Team Data Table** Shows initial starting values of experimental variables based on team data. **Experiment** Adjust experiment sliders to test different values in the sim by dragging the slider.

Team
Participatory System Dynamics

Five ways to improve MTL usefulness.

Email: **mtl.info@va.gov**

Subject line: **Learning**

1. MTL Live Team/Clinic
2. Pilot Review EES materials (e.g., Video, Guides)

Design

3. Data User Interface (mtl.how/data)

4. Simulation User Interface (mtl.how/demo)

Research

5. Advisory Board and other opportunities

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