

A close-up portrait of a man with dark, curly hair and a beard, looking directly at the camera with a slight smile. The lighting is warm and focused on his face, with a dark, blurred background.

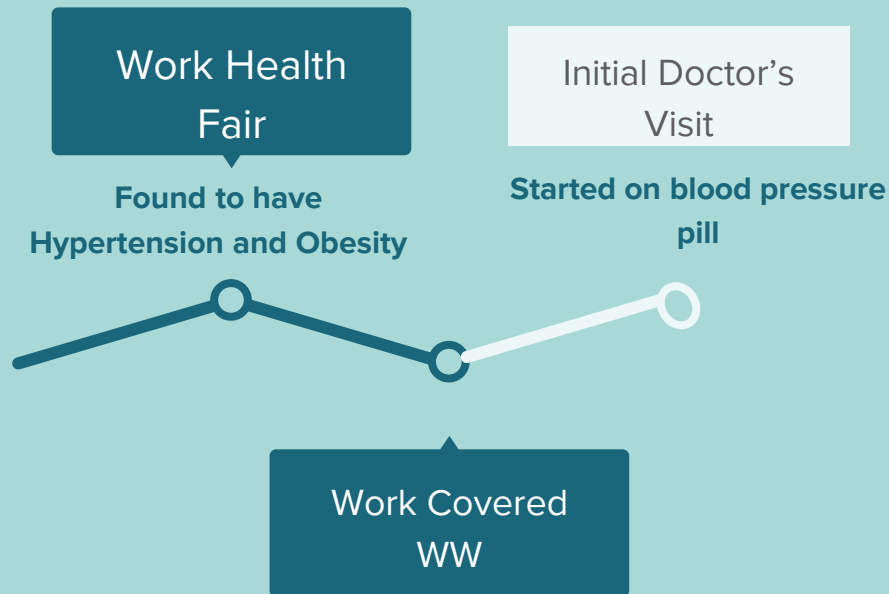
Engineering 360°

Obesity Care:

*Lesson Learned from HPSM -
Enara Pilot*

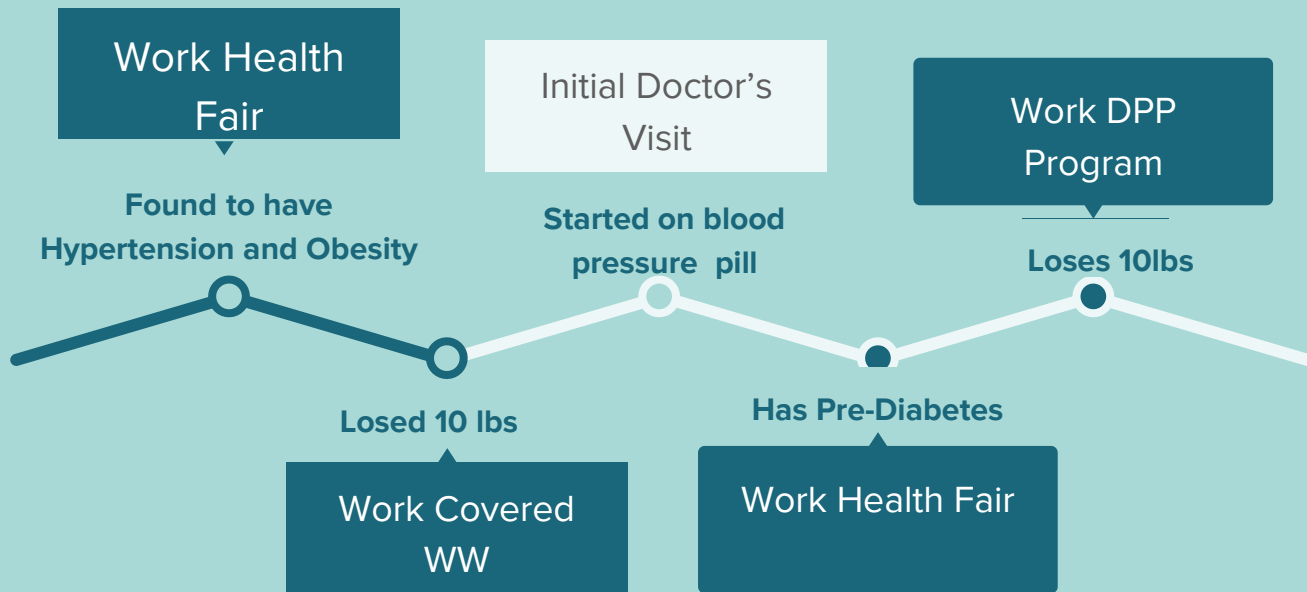
Meet Chris

- 36 year old husband and father.
- Works as internet/cable technician for last 9 years.
- BMI 35
- No medications

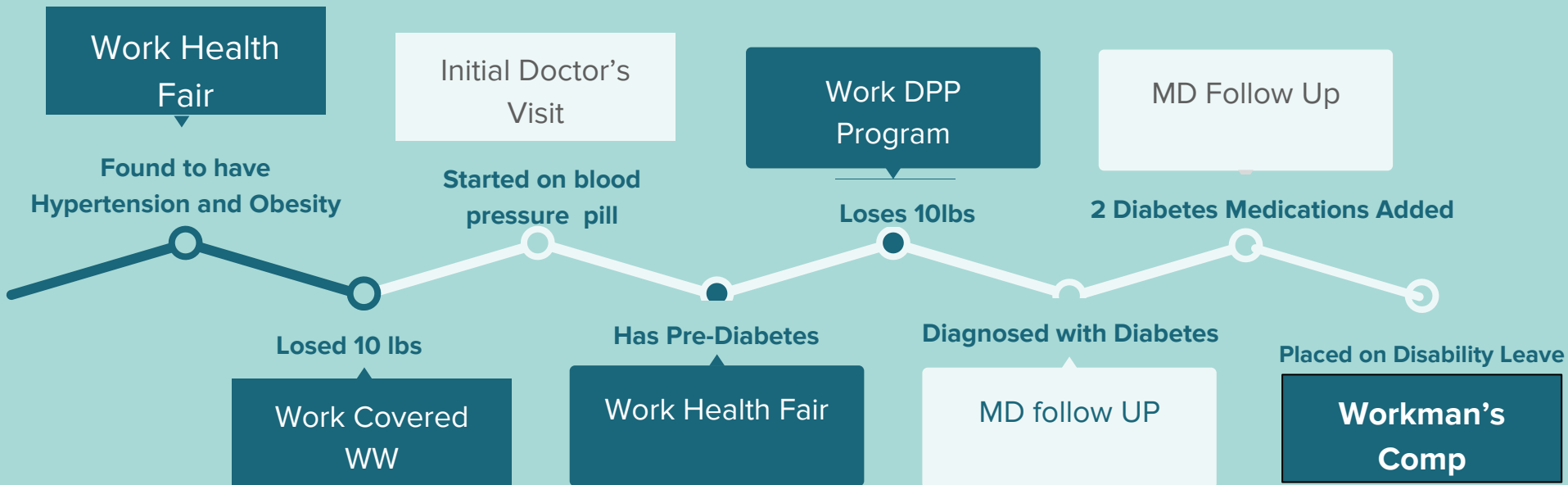


Chris gains more weight

- BMI 36
- Hypertension
- Metoprolol and Amlodipine for HTN
- A statin for cholesterol



Chris gains more more weight



Chris is looking for answers

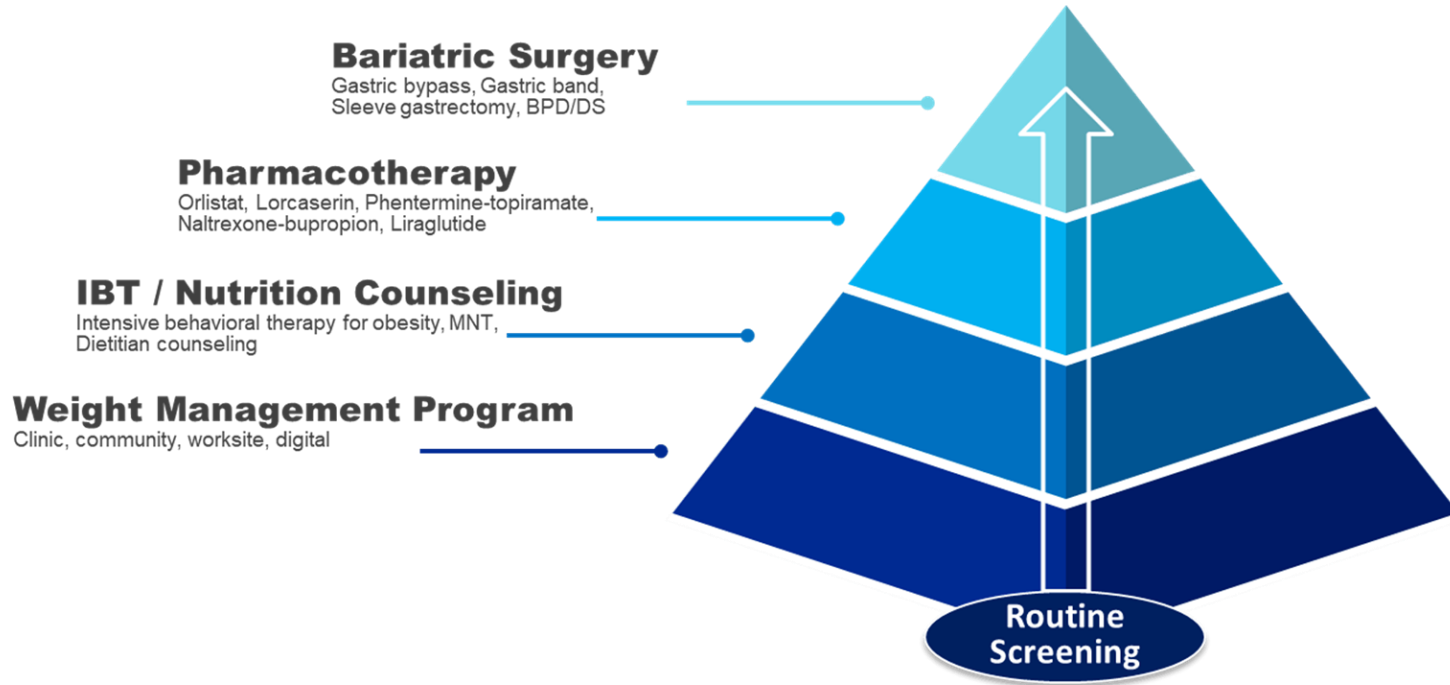
49 y/o male with Morbid Obesity (BMI 38, WC 53, PBF 40%) with uncontrolled diabetes (A1c 11.5) and high blood pressure

1. Lovastatin
2. Metoprolol ER 25mg ER
3. Amlodipine 10mg daily
4. Metformin 1000mg daily
5. Pioglitazone
6. Glipizide 10mg BID daily

Tackling Obesity and Pre-Diabetes in Underserved Populations

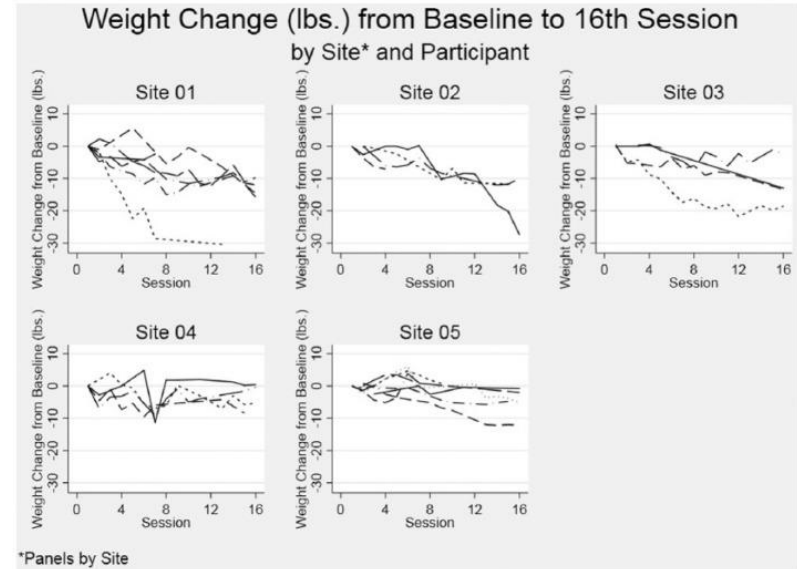


The Obesity Treatment Pyramid



DPP in Underserved Communities

- Omada Program at Washington Medicaid and So-Cal FQHC
 - Mean weight loss 4.4% at 12 months
 - 12 month engagement of 65%
- Power-Up Program in NYC
 - Mean weight loss of 3.8% at 16 weeks.

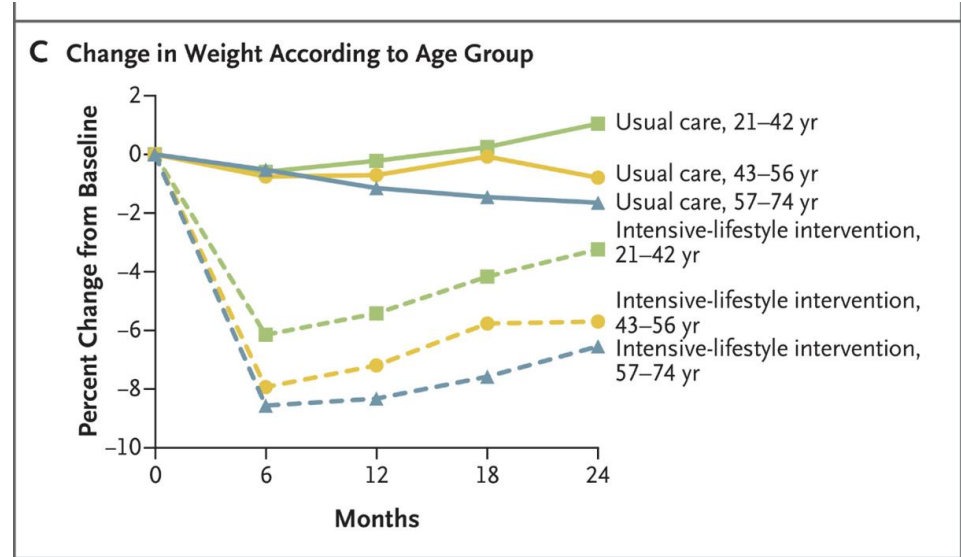


Kim, Sue E et al. "Evaluation of a Digital Diabetes Prevention Program Adapted for Low-Income Patients, 2016-2018." *Preventing chronic disease* vol. 16 E155. 27 Nov. 2019, doi:10.5888/pcd16.190156

Walker EA, Weiss L, Gary-Webb TL, et al. Power Up for Health: pilot study outcomes of a diabetes prevention program for men from disadvantaged neighborhoods. *Am J Mens Health* 2018;12:989-997

The PROPEL Trial

- Medical weight loss adapted from DPP ran at 18 underserved clinics
- Participants also given meal replacements
- Avg 4.99% WL at 24 months
- 83.5% completed the trial



AA have less weight loss and more weight regain with behavioral and lifestyle interventions

- **Lose 10-25% less weight.**
- **AA and Hispanics are 40 and 30% less likely to hit 5% weight loss.**
- **African Americans are 50% more likely to regain weight.**

1. Ostendorf, Danielle M., et al. "Predictors of Long-term Weight Loss Trajectories during a Behavioral Weight Loss Intervention: An Exploratory Analysis." *Obesity Science & Practice* (2021).
2. Weight Loss Disparities Among Hispanic and Underserved Participants, Colorado, 2015–2018
3. Katzmarzyk, Peter T., et al. "Weight loss in underserved patients—a cluster-randomized trial." *New England Journal of Medicine* 383.10 (2020): 909-918.
4. Daubenmier et al., Exploratory Analysis of Racial/Ethnic and Educational Differences in a Randomized Controlled Trial of a Mindfulness-Based Weight Loss Intervention, *Psychosomatic Medicine*: 7/8 2021 - Volume 83 - Issue 6 - p 503-514
5. Butryn, Meghan L., et al. "Efficacy of environmental and acceptance-based enhancements to behavioral weight loss treatment: the ENACT trial." *Obesity* 25.5 (2017): 866-872.

AA and Hispanics have better or equal response from placebo for medications

- AA have 1.5 to 2x the response to metformin as caucasian.
- In DDP, racial difference in outcomes were found in lifestyle group but not in the metformin group.
- Hispanics on liraglutide have same weight loss as non-hispanics and more weight loss from baseline.
- African Americans taking liraglutide are more likely to hit A1c goals and lose 25% more weight.

1. Williams et al., Differing effects of metformin on glycemic control by race-ethnicity. *J Clin Endocrinol Metab.* 2014 Sep;99(9):3160-8. doi: 10.1210/jc.2014-1539. Epub 2014 Jun 12. PMID: 24921653; PMCID: PMC4154100.
2. O'Neil, Patrick M., et al. "Effects of liraglutide 3.0 mg on weight and risk factors in hispanic versus non-hispanic populations: subgroup analysis from scale randomized trials." *Endocrine Practice* 22.11 (2016): 1277-1287.
3. Shomali, M. E., D. Dynnes Ørsted, and A. J. Cannon. "Efficacy and safety of liraglutide, a once-daily human glucagon-like peptide-1 receptor agonist, in African-American/black people with Type 2 diabetes: a meta-analysis of sub-population data from seven phase III trials."

The Enara - HPSM Pilot

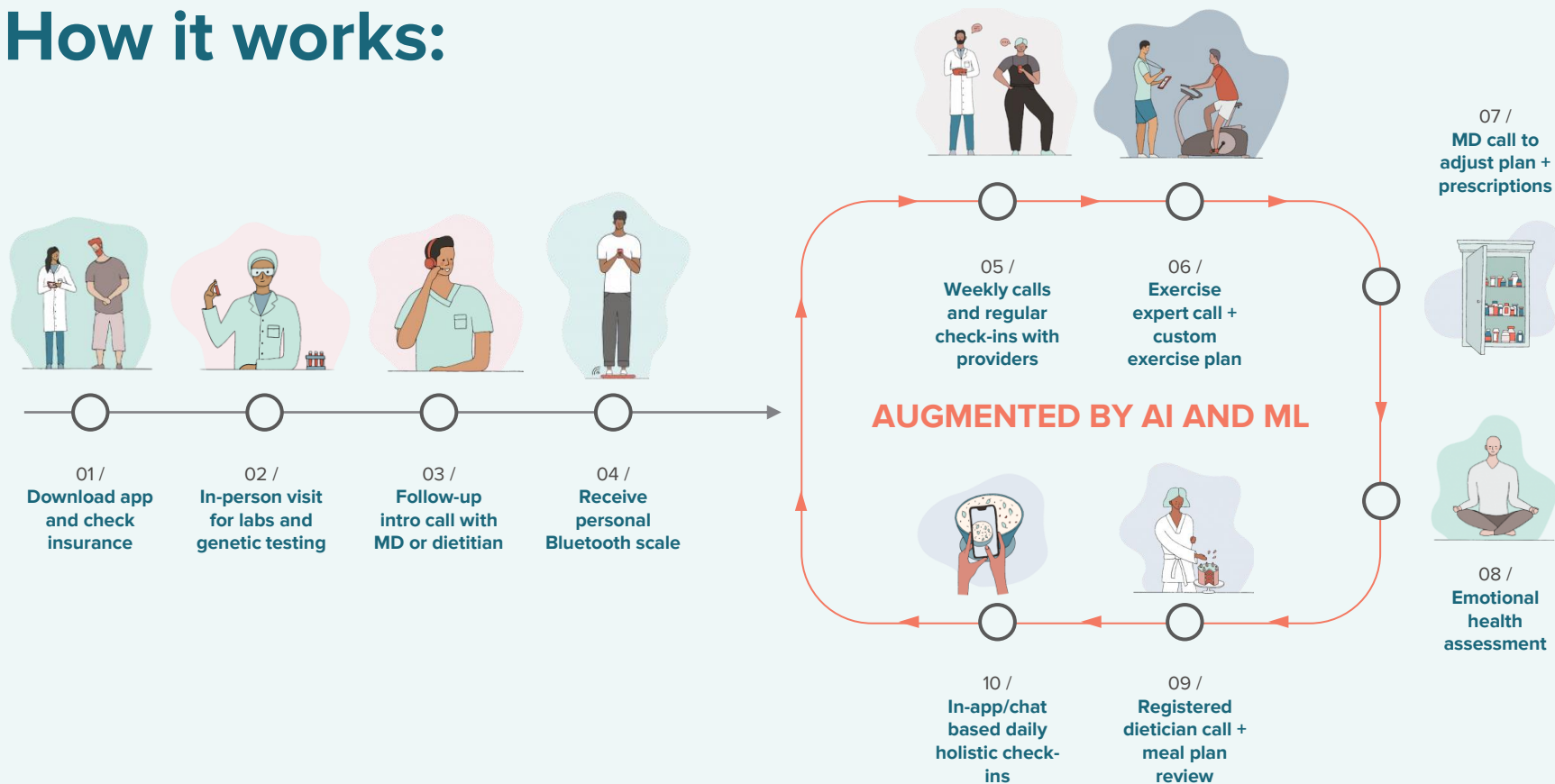


DPP + Enara



- Surround DPP program with tools to solve for Obesity
- No limits on visits
- ++ behavioral group counseling, cooking classes, grocery tours, exercise coaching.
- Obesity Medication Coverage with No Co-Pays

How it works:





Stephen

- Started with Enara May 2020

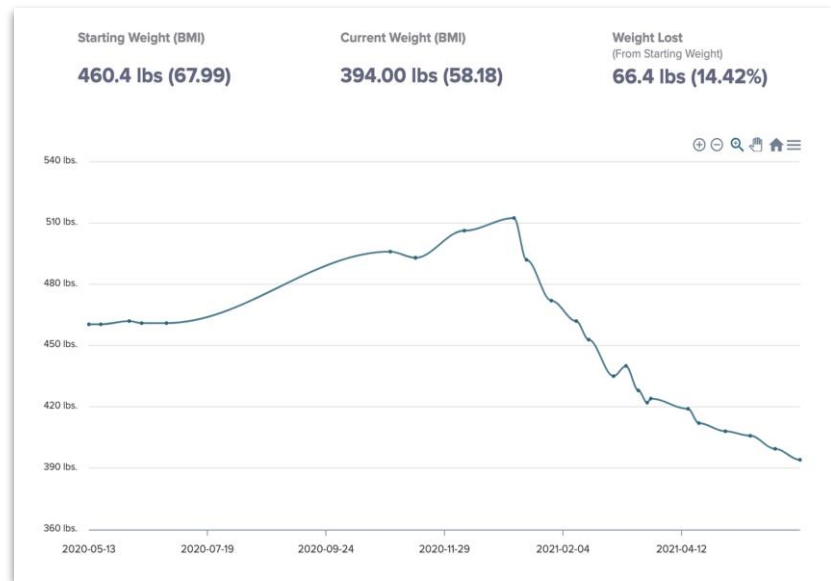
enara



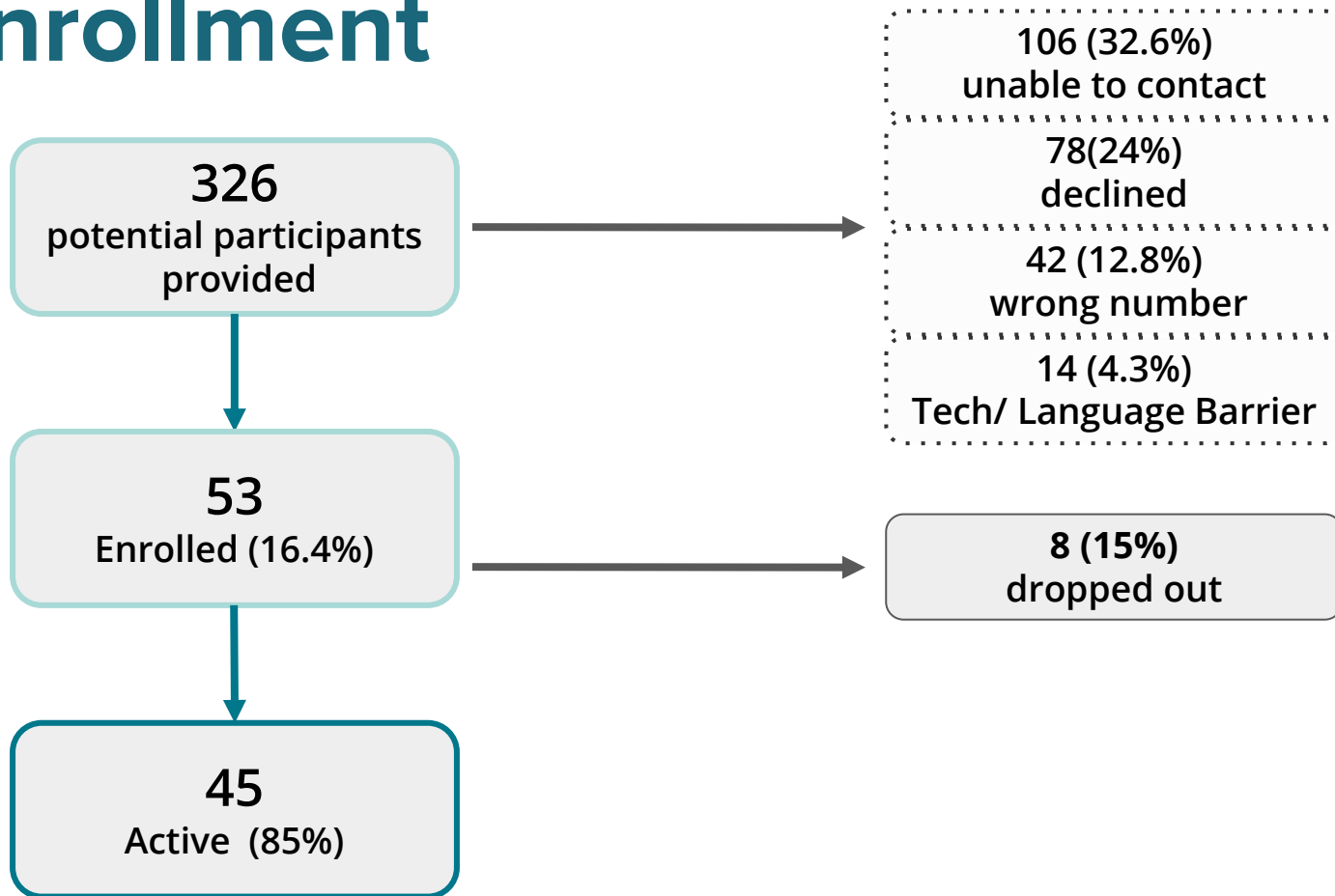




Breaking-Through Metabolic, Hormonal, Genetic, and Behavioral Barriers



Enrollment

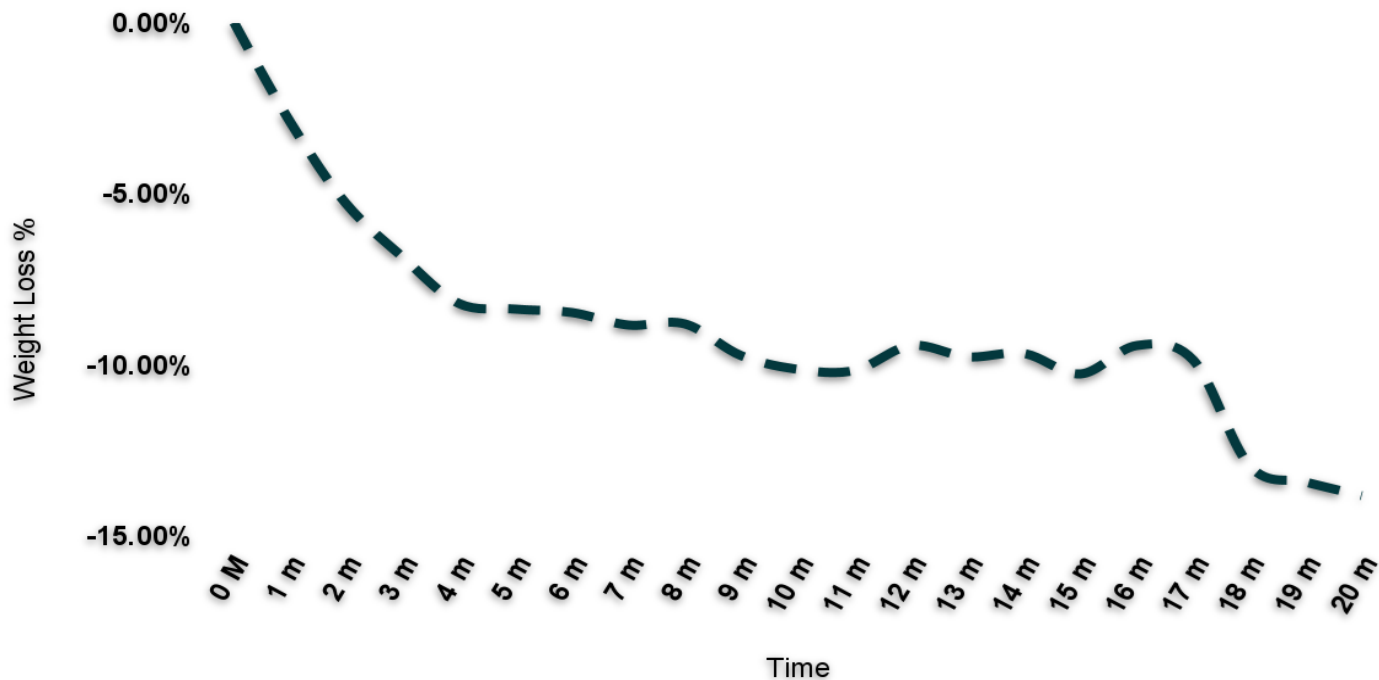


HPSM: Baseline Characteristics

	Male n= 22	Females n= 22	Total n= 44
Age (years)	50.77	49.55	50.02
Weight (kg)	256.28	214.61	235.44
BMI (kg/m2)	38.15	37.60	37.88
A1c	5.88	5.77	5.82
Glucose (mg/dL)	104.78	100.50	102.64
Insulin (μU/mL)	19.34	21.87	20.77
Triglycerides (mg/dL)	110.21	136.74	123.47
Total cholesterol (mg/dL)	167.42	183.95	175.68
LDL cholesterol (mg/dL)	104.68	110.53	107.61
HDL cholesterol (mg/dL)	41.42	48.05	44.74
HsCRP	2.52	8.27	5.67

HPSM: Average weight loss for the 20 month Cohort

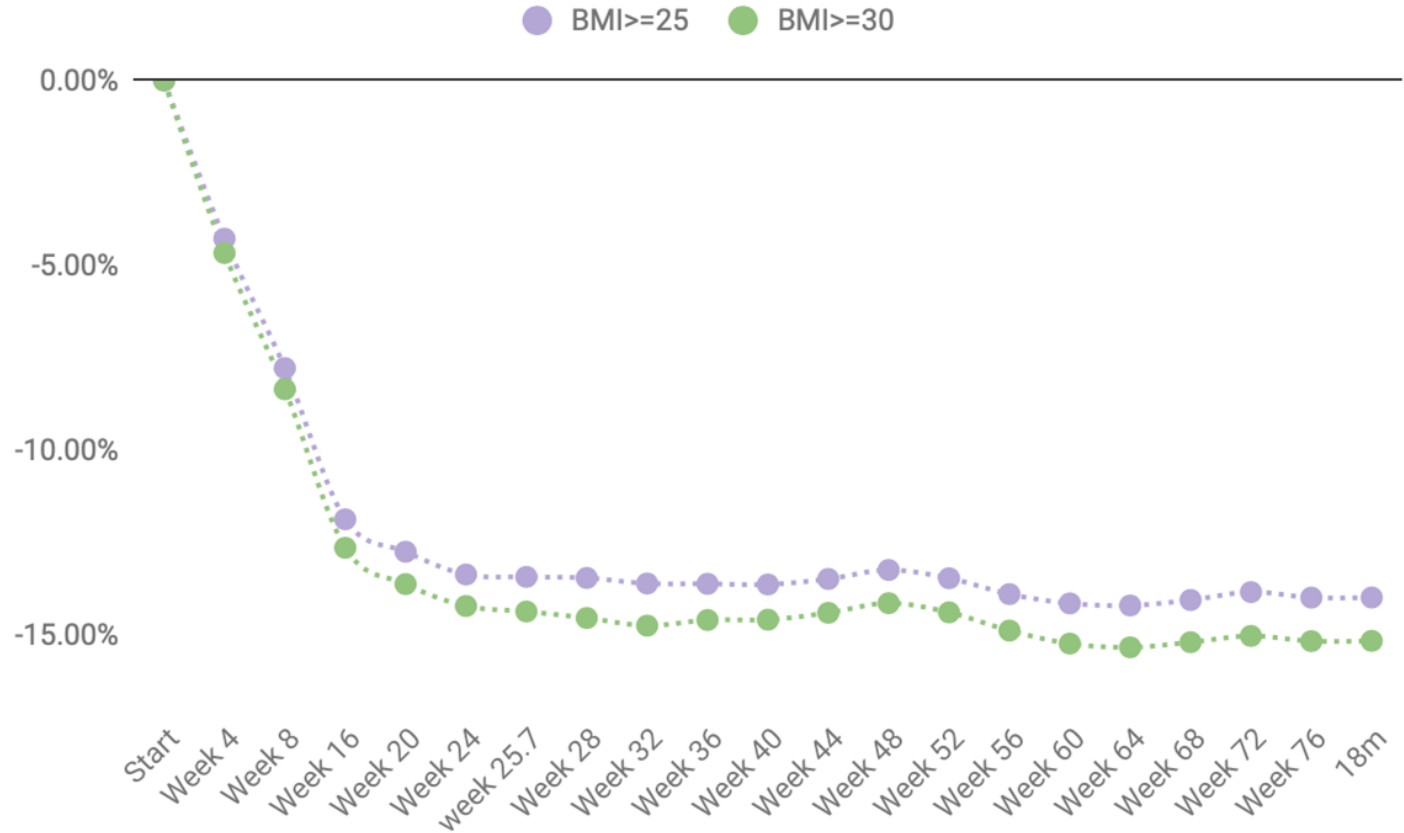
Weight Loss % Over Time



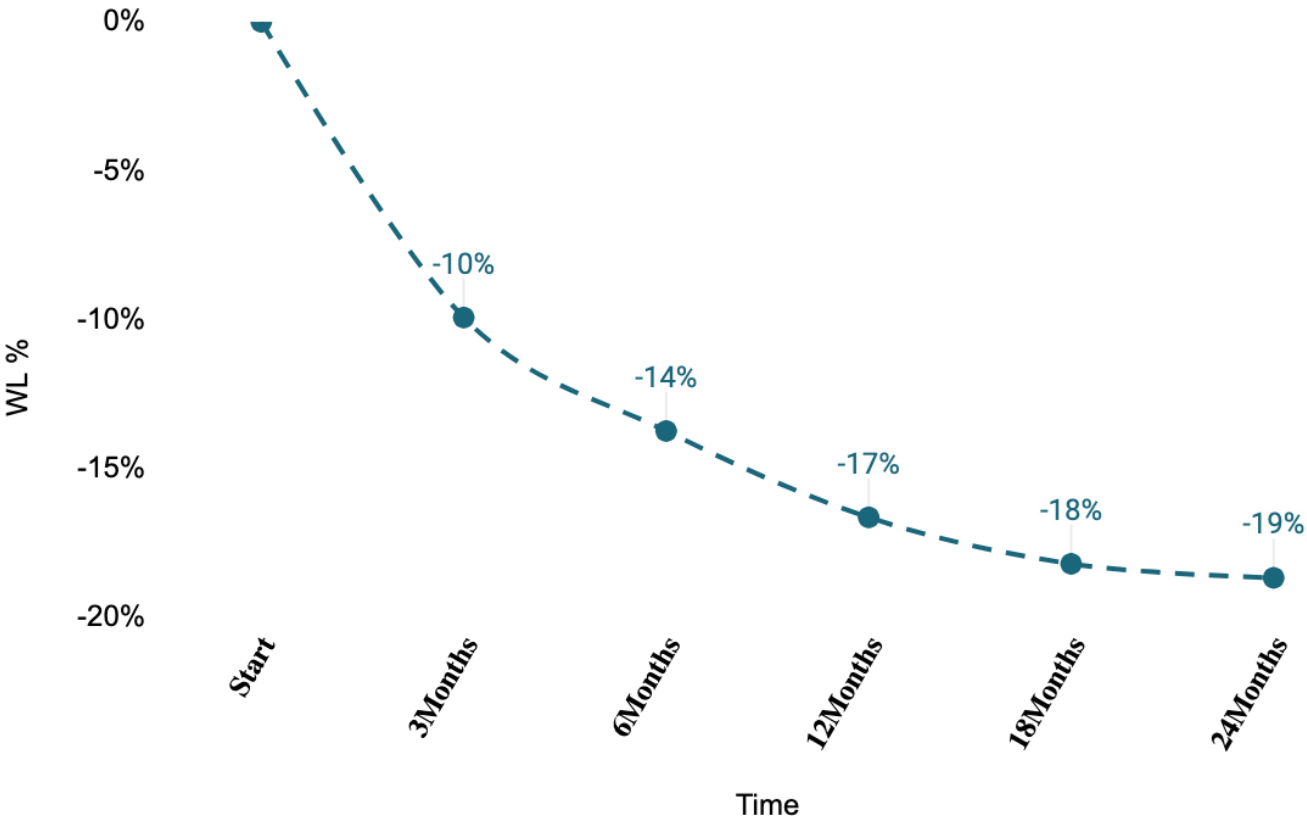
HPSM: Improvement Across All Health Metrics at 12 months

	Start	12m	Diff
Weight (lb)	242.75	218.51	-24.24
BMI (kg/m2)	38.30	34.81	-3.49
A1c	5.88	5.73	-0.15
Glucose (mg/dL)	101.41	96.43	-4.97
Insulin (μU/mL)	20.49	15.61	-4.88
Triglycerides (mg/dL)	135.14	125.68	-9.45
Total cholesterol (mg/dL)	179.27	178.05	-1.23
LDL cholesterol (mg/dL)	109.59	107.73	-1.86
HDL cholesterol (mg/dL)	44.00	47.82	3.82
HsCRP	6.21	3.59	-2.61

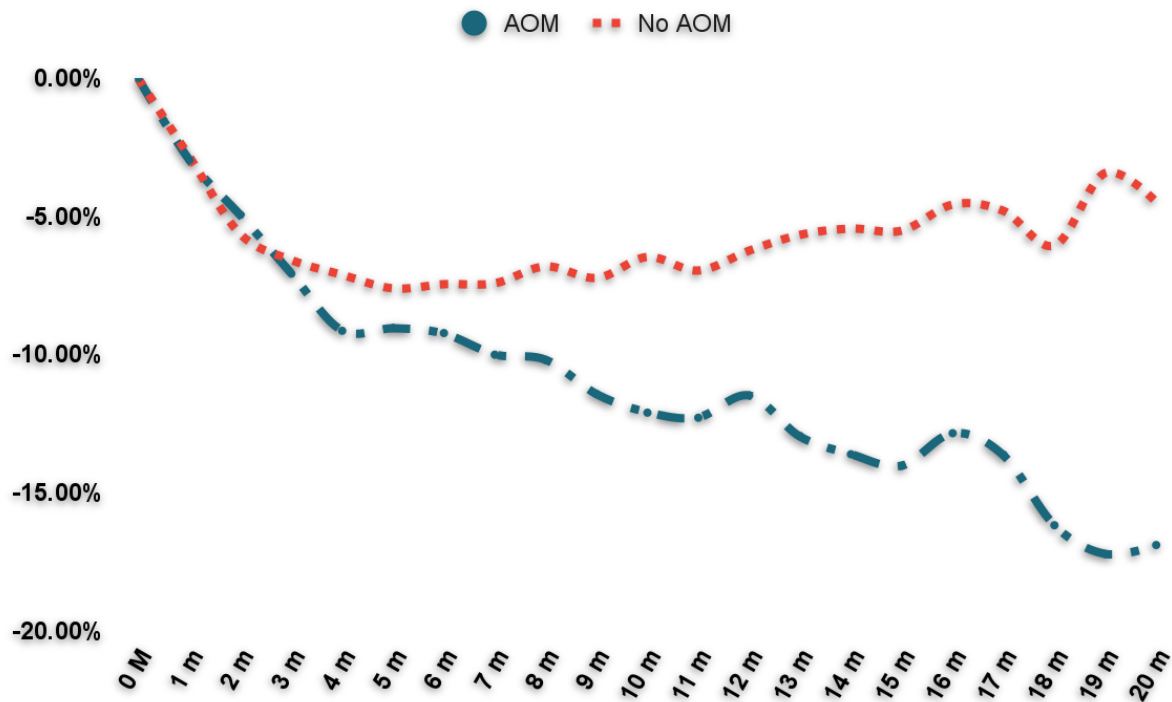
**Average
weight loss for
the 18 month
cohort was -
13.99%
(n=145).**



Average weight loss For All Enara Members with Starting BMI >40



HPSM: AOM(s) add 10% WL and make significant impact beyond 6m



Meet Paul

A Personal Story - HPSM

PM is a 47 year old man w/ a h/o Tetralogy of Fallot, Obesity, HTN, HLP, CAD s/p MI/stents, CHF EF 40%, predm2, sleep apnea, fatty liver, depression. He has a h/o substance abuse - crystal meth, ecstasy, mushrooms, Etoh and rehab x 3. He has been sober since his MI and CHF 2019. Unemployed and moved from Sacramento area w/ his 3 kids to live w/ parents and his brother for support. Divorced and spouse not involved in support of children. Niece died from COVID. Has been struggling with moderate depression. Lost CPAP 2019 in rehab.

**Began Enara 9/2020
BMI 38.39 Weight 260 lbs**



A Personal Story - HPSM

- On multiple medications including 7 BP meds (Lasix, Coreg, Spironolactone, Hydralazine, Isordil, amlodipine, Lisinopril)
- Started Saxenda and metformin
- Stepwise program
- Seen by our clinical psychologist to address depression
- Assisted w/ new CPAP machine
- Lost 49.24 lbs or 18.94% in 9 months
- BP meds down to 4 meds (Coreg, Lisinopril, Spironolactone, Isordil)
- More active: started 2-5k steps and now 10-20k steps
- Depression in remission

A1c	FI	TC	TRG	HDL	LDL	hsCRP	Cr
5.8	23.4	135	131	35	77	4.63	1.45
5.3	8.5	110	97	37	54	1.32	1.29

What have we learned?

1. A comprehensive obesity program can help overcome socioeconomic and racial disparities.
2. That the group taking AOMs had similar outcomes to broader Enara members.

Overcoming Weight Set Point Dysregulation

1. If obesity is caused by weight set point dysregulation.
2. And weight set point dysregulation is environmentally and socially mediated.
3. Then it's possible that pharmacologic therapy allows people to overcome obesogenic socio-economic and environmental factors.

The lack of broad obesity coverage hinders ability to tackle obesity and health disparities

1. There are large ethnic, racial, socio-economic disparities in obesity rates and co-morbidities.
2. Tackling obesity should be a central part of any health benefits plan.
3. There are key racial, ethnic, socio-economic differences in responses to obesity treatment (behavioral, surgical, and pharmacologic).
4. A broad obesity coverage policy that allows for treatment personalization is essential to reducing obesity disparities.
 - Offering lifestyle based solutions alone is likely discriminatory

Chris loses 50 lbs and reverses his diabetes

1. Lovastatin

~~2. Metoprolol ER 25mg ER~~

~~3. Amlodipine 10mg daily~~

4. Metformin 1000mg daily

~~5. Pioglitazone~~

~~6. Glipizide 10mg BID daily~~

1. Lovastatin

2. Losartan

3. Metformin 1000mg daily

4. Saxenda

Thank You

