



# Weight Loss in Adult Patients with NAFLD with and without Diabetes in the Yale Fatty Liver Disease Program

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## INTRODUCTION

Nonalcoholic fatty liver disease (NAFLD) is a global silent pandemic

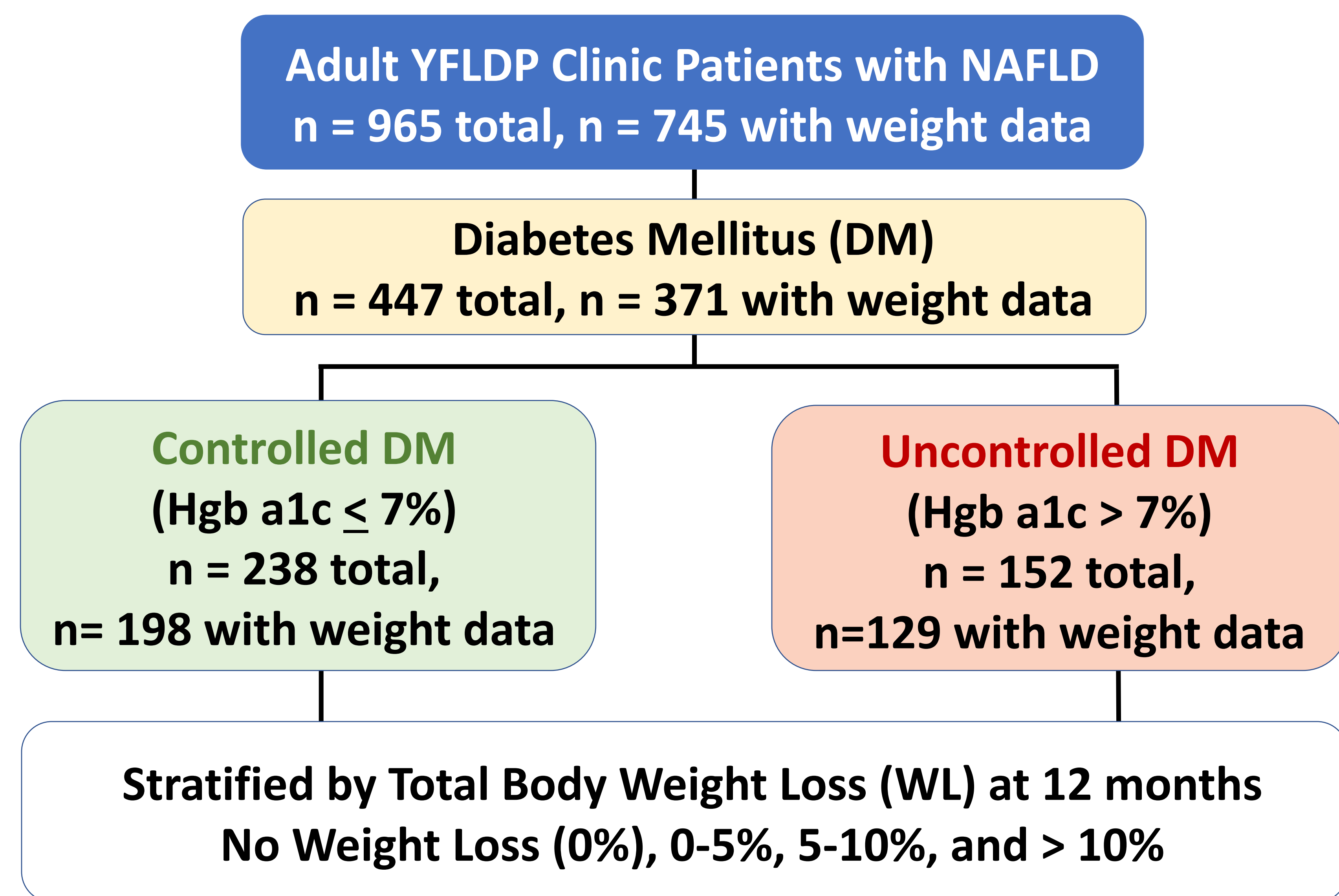
- 55% prevalence in type 2 diabetes mellitus (DM)
- Weight management is the key to NAFLD treatment
- 7-10% weight loss → NASH and fibrosis improvement
- DM exacerbates NAFLD → can make weight loss difficult

The Yale Fatty Liver Disease Program (YFLDP) is a specialty clinic integrating weight management and hepatology care.

Did weight loss differ between patients with NAFLD and comorbid DM compared to those without DM?

Were there differences between controlled and uncontrolled DM?

## METHODS



### Statistics

NAFLD Cohort Comparisons

no DM vs. DM

Controlled DM vs. Uncontrolled DM

Patient Characteristics

Liver Fibrosis Assessments

Clinic Weight Loss Interventions

Glycemic Control

## PATIENT CHARACTERISTICS & WEIGHT LOSS AT 12 MONTHS BY DM STATUS

Characteristics, n (%)	Total Cohort, n = 965	NAFLD, n = 518	NAFLD-DM, n = 447	NAFLD Cohort, n (%)	No Weight Loss	> 0 – 5%	> 5 – 10%	> 10%
Age (SD)	53.3 (13.4)	51.5 (14.2)	55.4 (12.1)	No Diabetes n = 374	154 (41%)	121 (32%)	54 (14%)	45 (12%)
Female	561 (58.1)	273 (52.7)	288 (64.4)					
White	763 (79.1)	431 (83.2)	332 (74.3)					
Black	73 (7.6)	24 (4.6)	49 (11)					
Other	106 (11.0)	50 (9.7)	56 (12.5)					
Unknown	23 (2.4)	13 (2.5)	10 (2.2)					
Hispanic Ethnicity	128 (13.3)	59 (11.4)	69 (15.4)	Diabetes (DM) n = 371	123 (33%)	122 (33%)	63 (17%)	63 (17%)
Private Insurance	536 (55.5)	316 (61.0)	220 (49.2)					
Medicaid	175 (18.1)	80 (15.4)	95 (21.3)					
Medicare	234 (24.2)	109 (21.0)	125 (28)					
Uninsured	20 (2.1)	13 (2.5)	7 (1.6)					
Prior Bariatric Surgery	117 (12.1)	33 (6.4)	84 (18.8)					
Alcohol-Related Disorder	116 (12)	74 (14.3)	42 (9.4)	Controlled DM (CDM) n = 198	62 (31%)	69 (35%)	33 (17%)	34 (17%)
Initial BMI (SD)	35.8 (8.2)	34 (7.3)	37.8 (8.6)					
				Uncontrolled DM (UDM) n = 129	42 (33%)	41 (32%)	23 (18%)	23 (18%)
				<i>p</i>	<b>0.023*</b>	0.88	0.34	0.055
				<i>p</i>	0.81	0.57	0.79	0.88

## COMPARISONS BETWEEN PATIENTS WITH NO WEIGHT LOSS VS. > 10% BY DM STATUS

Characteristic	NAFLD No WL	NAFLD >10% WL	<i>p</i>	NAFLD-DM No WL	NAFLD-DM >10% WL	<i>p</i>	NAFLD-CDM No WL	NAFLD-CDM >10% WL	<i>p</i>	NAFLD-UDM No WL	NAFLD-UDM >10% WL	<i>p</i>	
													Mean (SD)
Weight (kg)	94 (25.6)	103.3 (20.2)	0.01*	103.6 (28.4)	110.3 (27.2)	0.12	105.9 (31.5)	115.9 (32.4)	0.15	100.5 (27.8)	104.7 (19.5)	0.49	
Fibroscan Stiffness (kPa)	9.2 (9.1)	8.4 (6.4)	0.57	10.7 (7.9)	13.2 (13.2)	0.24	9.4 (7.4)	12.7 (16.4)	0.38	13.5 (9.1)	14.1 (9.5)	0.83	
FIB-4 Score	1.6 (1.5)	1.8 (2.4)	0.57	1.5 (1.5)	1.9 (1.9)	0.17	1.4 (1.2)	1.9 (2.3)	0.24	1.5 (1.2)	1.8 (1.3)	0.48	
Nutrition Consult	70 (45.5)	22 (48.9)	0.68	61 (49.5)	31 (49.2)	0.96	29 (46.8)	17 (50)	0.76	23 (54.8)	11 (47.8)	0.59	
OPTIFAST® Program	3 (2.0)	2 (4.4)	0.35	2 (1.6)	7 (11.1)	0.004*	2 (3.23)	3 (8.8)	0.24	0 (0)	3 (13.0)	0.04*	
Naltrexone/Bupropion	4 (2.6)	0 (0)	0.58	8 (6.5)	4 (6.3)	0.97	4 (6.5)	3 (8.8)	0.67	3 (7.1)	0 (0)	0.55	
Semaglutide	16 (10.4)	14 (31.1)	0.001*	30 (24.4)	27 (42.9)	0.010*	15 (24.2)	13 (38.2)	0.15	10 (23.8)	12 (52.2)	0.02*	
Liraglutide	11 (7.1)	6 (13.3)	0.19	13 (10.6)	6 (9.5)	0.82	6 (9.7)	4 (11.8)	0.75	5 (11.9)	1 (4.3)	0.31	
Phentermine	5 (3.2)	7 (15.6)	0.002*	12 (9.8)	8 (12.7)	0.54	5 (8.1)	6 (17.6)	0.16	2 (4.8)	1 (4.3)	0.94	
Bariatric Surgery Referral	7 (4.6)	5 (11.1)	0.10	28 (22.8)	20 (31.8)	0.19	17 (27.4)	13 (38.2)	0.27	5 (11.9)	7 (30.4)	0.07	
Glycemic Control				Initial Hgb a1c	5.9 (0.6)	5.8 (0.6)	0.17	8.4 (1.0)	8.2 (1.1)	0.52			
				Final Hgb a1c	6.2 (1.0)	5.5 (0.7)	<0.001*	7.7 (1.3)	6.6 (0.9)	<0.001*			
				Delta Hgb a1c	0.2 (0.8)	-0.4 (0.7)	0.001*	-0.7 (1.3)	-1.6 (1.3)	0.01*			

## CLINIC PATIENTS WITH NAFLD, REGARDLESS OF DIABETES, ACHIEVED WEIGHT LOSS

The majority of NAFLD and NAFLD-DM patients in a weight loss-focused liver clinic:

- Successfully achieved weight loss in a relatively short period
- NAFLD-DM group had higher initial mean weights and lost more weight than NAFLD alone
- Patients with NAFLD-DM and UDM did not have significantly worse outcomes with weight loss

Next Steps:

- Longitudinal fibrosis staging data and 3-year clinic outcomes
- Treatment adherence analysis
- Predictive weight loss modeling