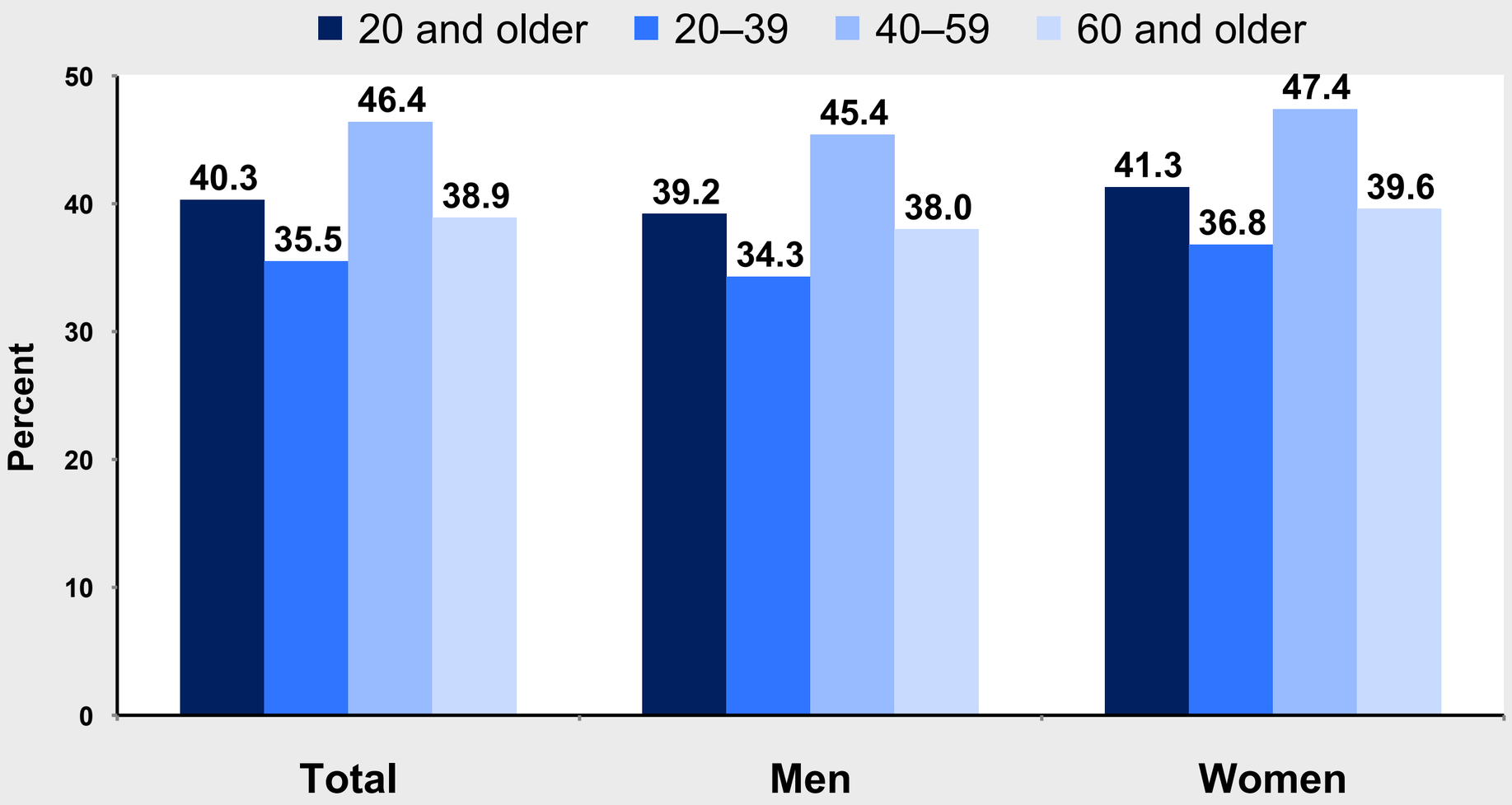
Prevalence of Obesity in US Adults

National Health and Nutrition Examination Survey, August 2021–August 2023



NOTE: Age-adjusted estimates for adults age 20 and older are 40.3% for the total population, 39.3% for men, and 41.4% for women and were age adjusted by the direct method to the U.S. Census 2000 population using age groups 20–39, 40–59, and 60 and older.

Emmerich SD, et al. *NCHS Data Brief*. 2024;508:10.15620/cdc/159281.

Psoriasis: Epidemiology

- Psoriasis is a chronic, immune-mediated skin disease
- 125 million people are affected worldwide
- **Prevalence:** 3.2% of the US adult population (global prevalence 2–4%)
  - Equal prevalence in men vs women
- **Incidence:** 30.3 per 100,000 person-years in East Asia to 321.0 per 100,000 person-years in Europe
- African Americans are more likely to have ≥3% body surface area (BSA) compared with Caucasians (30% vs 14%) but are less likely to receive biologics
- 15–30% have **psoriatic arthritis** (PsA)

Armstrong AW, Read C. *JAMA*. 2020;323:1945-1960. Alinaghi F, et al. *J Am Acad Dermatol.* 2019;80:251-265.e19. Damiani G, et al. *Front Med (Lausanne)*. 2021;8:743180.

Overlapping Mechanisms of Psoriasis and Obesity

Pathophysiology of psoriasis and obesity	Mechanism
Inflammation	Obesity triggers low-grade chronic inflammation, which can exacerbate psoriasis by promoting cytokine release and immune system dysregulation
Insulin resistance	Insulin resistance, common in obesity, may contribute to psoriasis by affecting keratinocyte proliferation and inflammation
Adipokines	Adipose tissue secretes adipokines, which can influence immune responses and skin inflammation in psoriasis
Gut microbiota	Obesity-related changes in gut microbiota composition can impact systemic inflammation and exacerbate psoriasis through microbiota-skin axis interactions
Genetic factors	Shared genetic susceptibility between psoriasis and obesity may contribute to their co-occurrence

Vata D, et al. *Life (Basel)*. 2023;13:1947.

Psoriasis and CV Disease: Bi-Directional Relationship

Shared genetic factors
- Coronary artery disease and psoriasis GWAS
- *IFIH1* and *IL23A*
- *PCSK9*
- *CDKAL1*
- Triglyceride-related variants

Environment and behavior
- Smoking
- Stress
- Low levels of exercise

Social and lifestyle interventions

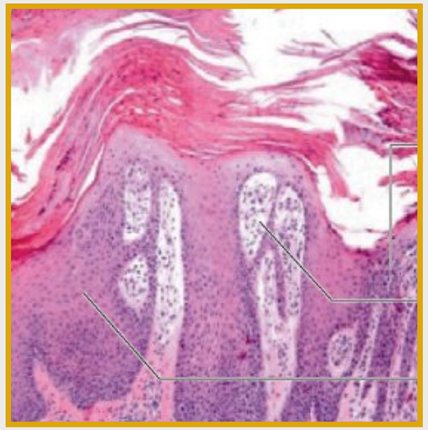
Lipid-lowering and antiplatelet therapies

Dysregulated plasma lipids and platelet activation
↓ HDL efflux
↓ LDL size
↑ Oxidized LDL
↑ Platelet-leukocyte aggregates

Risk factor modification
- **Weight loss or GLP1R agonists**
- **Antihypertensive drugs**

Disease mechanisms

Undertreated cardiovascular risk factors
- **Obesity**
- Dyslipidemia
- Hypertension
- MASH
- Glucose intolerance



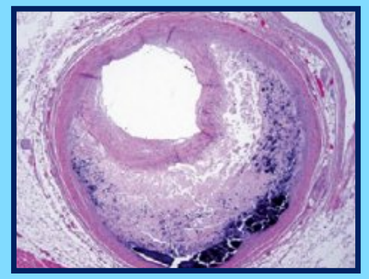
Heightened immune activation and metabolic dysfunction
Upregulated or activated:
- Th1 and Th17 cells
- Macrophages
- Neutrophils (NETosis)
- Platelet-leukocyte aggregates
- IFNγ, IL-1β, IL-6, IL-8, IL-17, IL-23, TNF

Angiogenesis

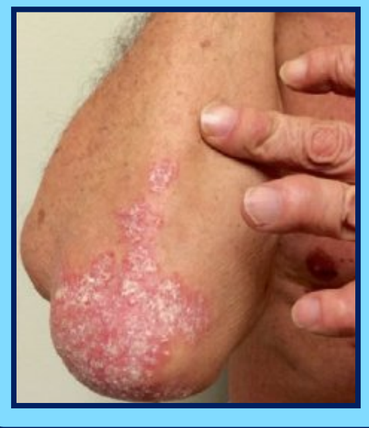
Epidermal hyperproliferation, leading to increased uric acid levels

- **Ultraviolet B phototherapy**
- **Small-molecule inhibitors**
- **Biologic therapies**

Atherosclerotic cardiovascular disease and events
- Microvascular disease
- Macrovascular disease
  - Myocardial infarction
  - Stroke
- Heart failure



Psoriasis



GLP1R = glucagon-like peptide 1 receptor; GWAS = genome-wide association studies; HDL = high-density lipoprotein; IFNγ = interferon gamma; IL = interleukin; LDL = low-density lipoprotein; MASH = metabolic dysfunction-associated steatohepatitis; TNF = tumor necrosis factor.

Gelfand JM, et al. *Nat Rev Cardiol*. 2025;22:354-371.

Obesity Is a Strong Independent Risk Factor for Psoriasis

Incidence of psoriasis according to BMI category				
Outcomes/measures of association	Normal weight/ underweight BMI <25.0 n = 461,236	Overweight BMI ≥25.0 to <30.0 n = 466,169	Obese class 1 BMI 30.0–34.9 n = 303,336	Obese class 2/3 BMI ≥35.0 n = 275,806
Total person-years of follow-up	1,741,310.7	1,882,653.2	1,242,987.8	1,126,226.6
Number of new psoriasis cases	1659	2247	1768	1959
Crude incidence rate per 10,000 person-years (95% CI)	9.5 (9.1–10.0)	11.9 (11.4–12.4)	14.2 (13.6–14.9)	17.4 (16.6–18.2)
Crude HR (95% CI)	Ref.	1.26 (1.19–1.35)	1.51 (1.41–1.61)	1.84 (1.72–1.96)
Adjusted hazard ratio (95% CI)	Ref.	1.19 (1.12–1.27)	1.43 (1.34–1.53)	1.83 (1.71–1.95)
***P*- value (adjusted HR)**	Ref.	<.001	<.001	<.001
Sensitivity analysis Adjusted HR (95% CI)	Ref.	1.19 (1.12–1.27)	1.43 (1.34–1.53)	1.84 (1.73–1.97)

BMI = body mass index; CI = confidence interval; HR = hazard ratio.

Norden A, et al. *J Am Acad Dermatol*. 2022;86:1020-1026.

Higher BMI Is Associated With Increased Risk of PsA

- Compared to individuals with BMI <25 kg/m²
  - **BMI 25–29.9** → OR: **1.79** (95% CI 1.46–2.19)
  - **BMI 30–34.9** → OR: **2.10** (95% CI 1.67–2.63)
  - **BMI ≥35** → OR: **2.68** (95% CI 2.09–3.43)

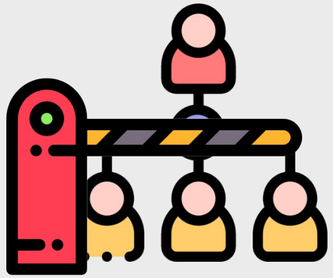
- Associations remained significant after adjusting for confounders

Green A, et al. *Br J Dermatol*. 2020;182(3):714-720.

Potential Ways to Help Patients Lose Weight

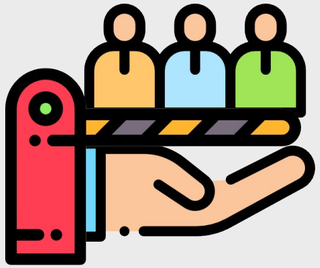
Educate	Educate the patient about the link between obesity and psoriatic disease outcomes
Discuss	Discuss healthy lifestyle choices as a part of a continuum of care
Refer	Refer to a dietician or weight loss program
Refer	Refer to primary care
Build	Multidisciplinary care is useful

Barriers to Weight Loss in Psoriatic Disease



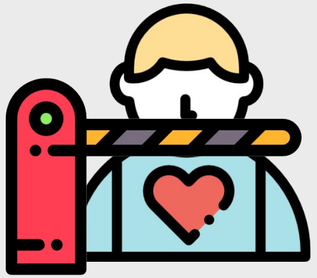
Organization-level barriers

- Leadership does not prioritize or expect dermatologist/rheumatologist to screen and manage CV risk
- Integrated approach or care coordination to screen and manage CV risk



Provider-level barriers

- Limited time with patients
- Belief that their priority is psoriatic disease management
- Limited knowledge and training about obesity management
- Belief that obesity management is not appropriate for dermatologist/ rheumatologist to do (outside of their scope of practice)



Patient-level barriers

- Relationship with provider
- Limited knowledge/awareness of CV risk/obesity related to their psoriatic disease
- Potential for resistance to CV risk screening and management
- Personal preference of managing their psoriatic disease
- Burden of disease

CV = cardiovascular.

Adapted from Gustafson AC, et al. *J Psoriasis Psoriatic Arthritis*. 2022;7(4):174-186.

Assess for Obesogenic Drugs

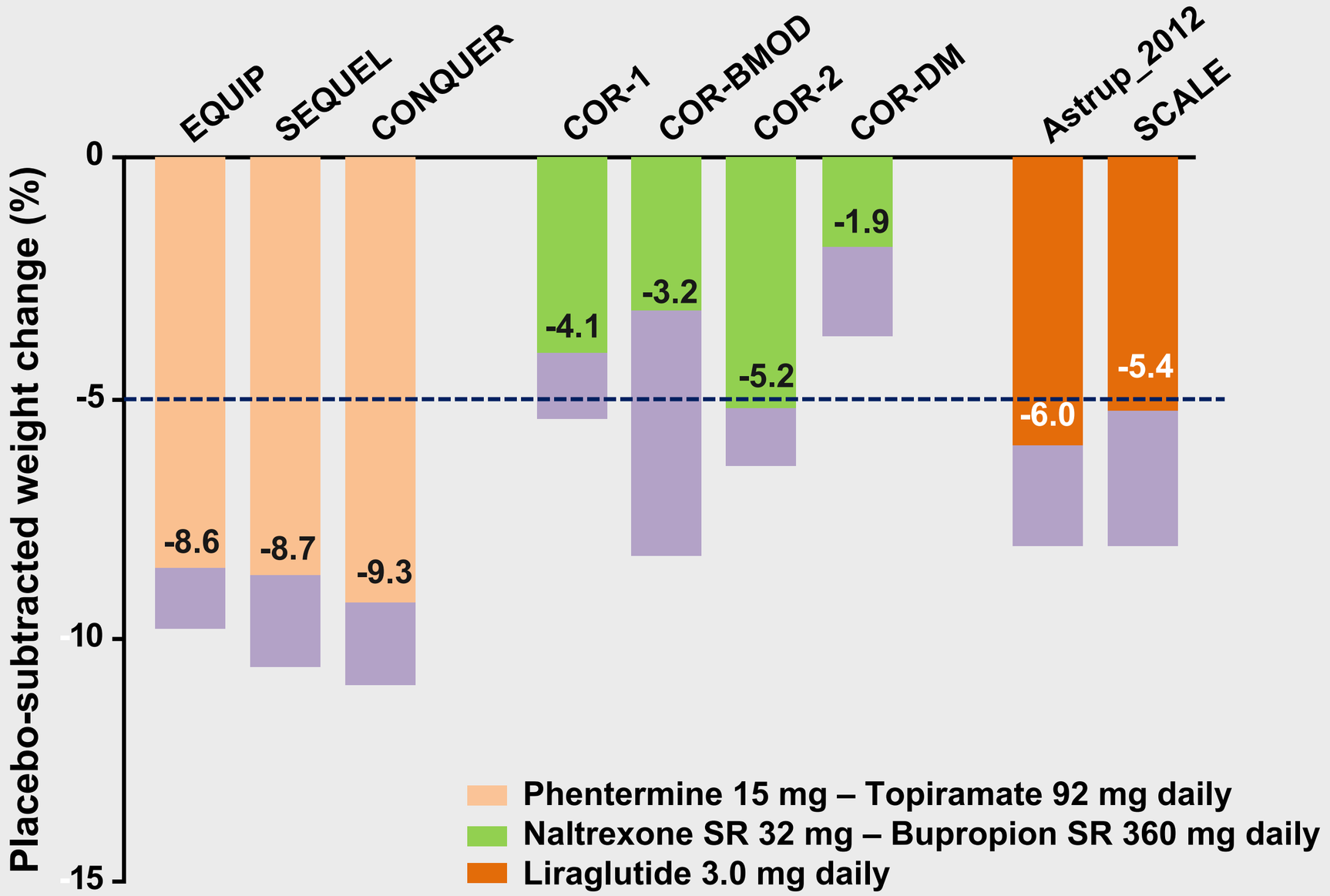
Alpha-blockers	Antipsychotics	Antidepressants	Antiseizure medications
• Terazosin • Doxazosin • Prazosin	• Quetiapine • Risperidone • Olanzapine • Chlorpromazine	• Mirtazpine • Some selective serotonin reuptake inhibitors (SSRIs) • Monoamine oxidase inhibitor (MAOI) • Tricyclic antidepressants (TCAs)	• Gabapentin • Pregabalin

Antihyperglycemic drugs	Beta blockers	Antiretrovirals	H1 antihistamines
• Insulin • Sulfonylureas • Meglitinides • Thiazolidinediones (TZDs)	• Metoprolol • Atenolol • Propranolol	• Protease inhibitors • Integrase inhibitors	• Hydroxyzine • Diphenhydramine • Cetirizine • Desloratadine • Fexofenadine

GLUCOCORTICOIDS

US Department of Veterans Affairs/Department of Defense (VA/DOD). Management of overweight and obesity in adults, 2025 (https://www.healthquality.va.gov/guidelines/cd/obesity/). Accessed 12/11/2025.

Modest Weight Loss With Several Early Antiobesity Medications



Adapted from Rueda-Clausen CF, et al. *Nat Rev Endo*. 2013;9:467-478. Astrup A, et al. *Int J Obes*. 2012;36:843-854. Pi-Sunyer X, et al. *N Engl J Med*. 2015;373:11-22.

American Diabetes Association/Obesity Association: 2026 Guidelines on Obesity Pharmacotherapy

Goal: achievement and maintenance of weight reduction and prevention of obesity-related diseases and complications

Without related diseases or complications

Weight-reducing effect of obesity medication beyond 3% weight loss with lifestyle change alone*

High (>10%)	**Moderate (5–10%)**	**Modest (<5%)**
Tirzepatide (A)	Phentermine-topiramate (A)	Naltrexone-bupropion (**A**)
Semaglutide (A)		Liraglutide (**A**)
		Phentermine (**C**)
		Orlistat (**A**)

Select obesity medication that aligns with individual goals and does not present barriers to its long-term use

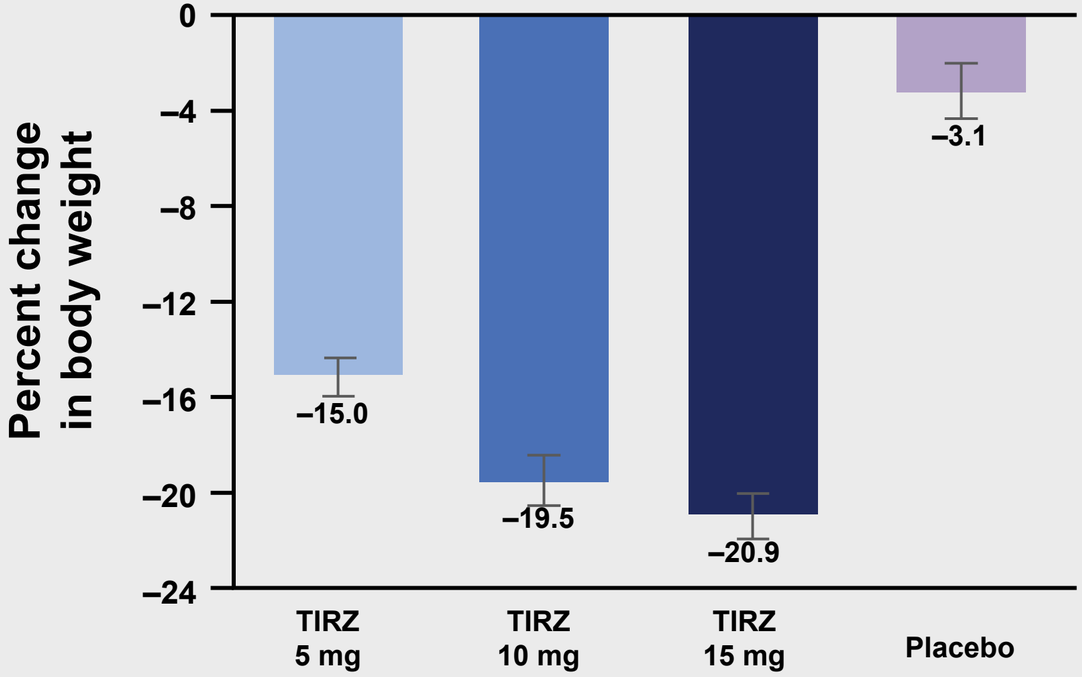
Levels of evidence: A = demonstrated benefit; B or C = potential benefit

ADA = American Diabetes Association.

ADA Professional Practice Committee for Obesity. *BMJ Open Diabetes Res Care.* 2026;13(suppl1):e005729.

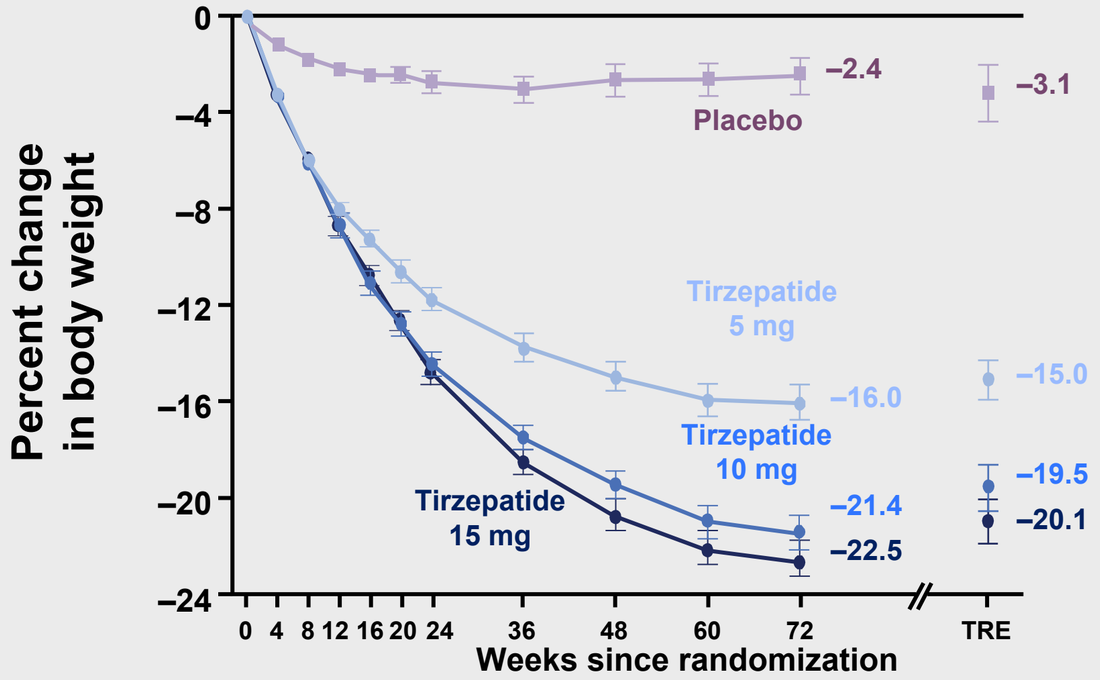
Effect of Once-Weekly Tirzepatide vs Placebo on Body Weight (SURMOUNT-1)

Overall percent change in body weight from baseline (treatment-regimen estimand)



Percent change in body weight by week (efficacy estimand)

Overall mean baseline weight: 104.8 kg



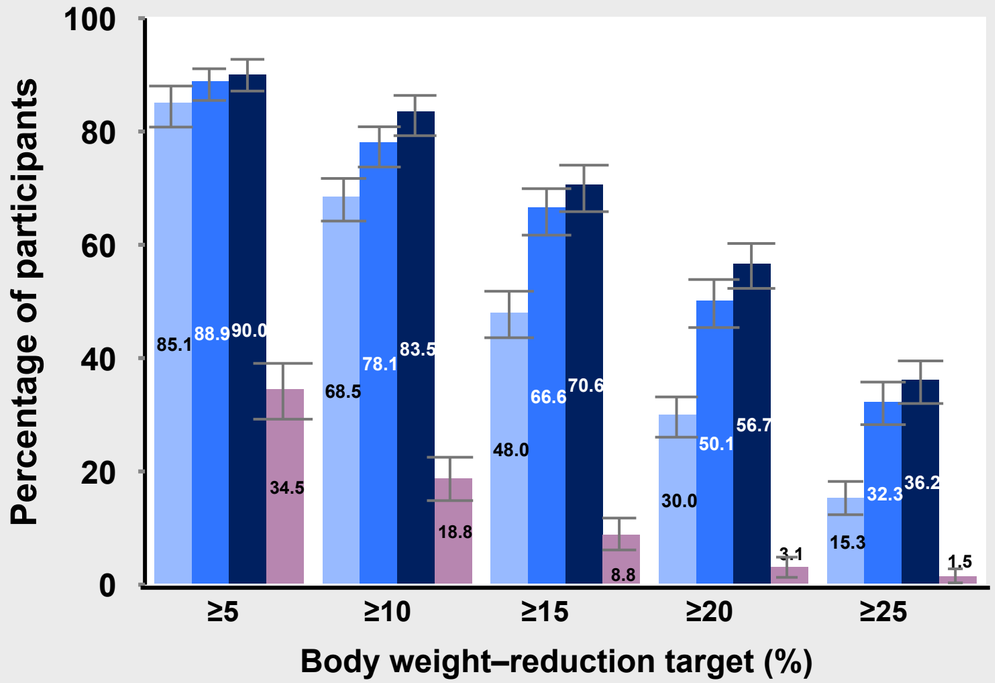
Tirzepatide 5 mg | Tirzepatide 10 mg | Tirzepatide 15 mg | Placebo

TIRZ = tirzepatide; TRE = treatment-regimen estimand.

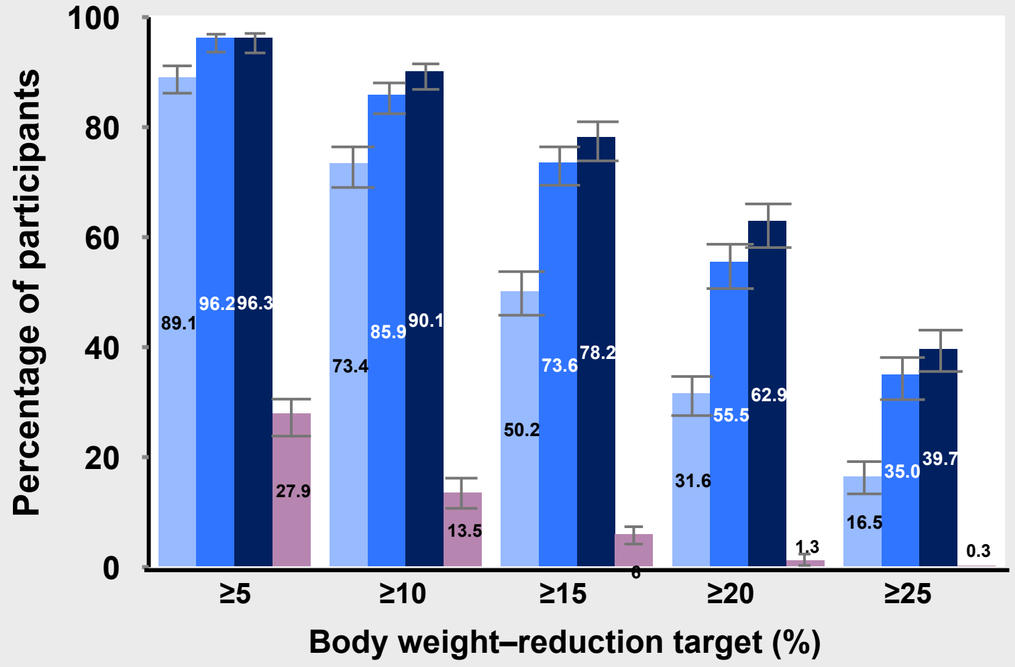
Jastreboff AM, et al. *N Engl J Med*. 2022;387(3):205-216.

Effect of Once-Weekly Tirzepatide vs Placebo on Body Weight (SURMOUNT-1)

Participants who met weight-reduction targets (treatment-regimen estimand)



Participants who met weight-reduction targets (efficacy estimand)

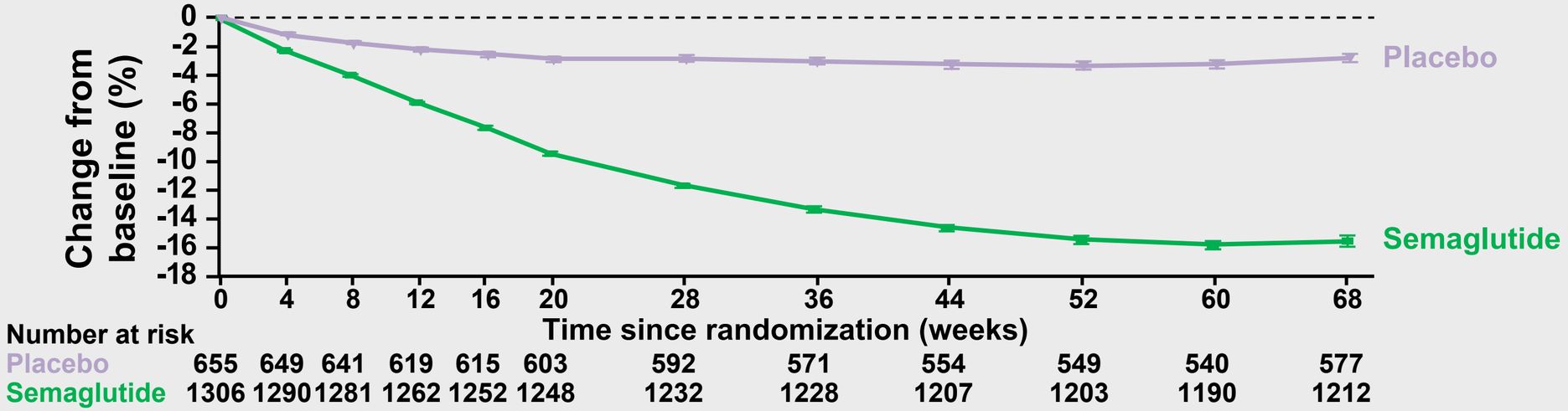


Tirzepatide 5 mg | Tirzepatide 10 mg | Tirzepatide 15 mg | Placebo

Jastreboff AM, et al. *N Engl J Med*. 2022;387(3):205-216.

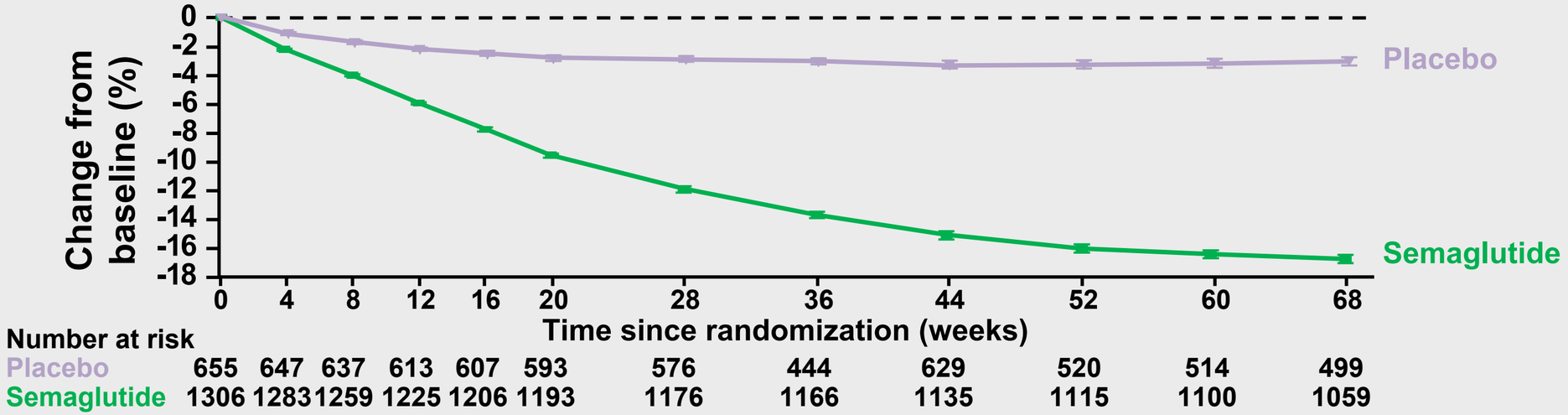
Effect of Once-Weekly Semaglutide vs Placebo on Body Weight (STEP-1)

Body weight change from baseline by week, observed in-trial data



Number at risk												
Placebo	655	649	641	619	615	603	592	571	554	549	540	577
Semaglutide	1306	1290	1281	1262	1252	1248	1232	1228	1207	1203	1190	1212

Body weight change from baseline by week, on-treatment data



Number at risk												
Placebo	655	647	637	613	607	593	576	444	629	520	514	499
Semaglutide	1306	1283	1259	1225	1206	1193	1176	1166	1135	1115	1100	1059

Wilding JPH, et al. *N Engl J Med*. 2021;384(11):989-1002.

Oral Semaglutide: Significant Weight Loss in OASIS 4
Approved by the FDA December 2025

- 71-week randomized controlled trial (RCT) (N = 205 patients with obesity, without diabetes)

Semaglutide 25 mg	Placebo	95% CI	*P*-value
−13.6%	−2.2%	−13.9 to −9.0	< .001

- Semaglutide group
  - Significantly more likely to achieve 5%, 10%, 15%, and 20% weight reduction
  - Significantly higher improvement in physical function
  - Gastrointestinal (GI) events more common (74% vs 42% placebo)

Wharton S, et al. N Engl J Med. 2025;393:1077-1087.

ATTAIN-1: Significant Weight Loss With Oral Orforglipron

- 72-week RCT (N = 3127 patients with obesity, without diabetes)

Orforglipron (95% CI)		Placebo	*P*-value
6 mg	**−7.5%** (−8.2 to −6.8)	**−2.1%** (−2.8 to −1.4)	**< .001**
12 mg	**−8.4%** (−9.1 to −7.7)		**< .001**
36 mg	**−11.2%** (−12.0 to −10.4)		**< .001**

Orforglipron group

- Significantly more likely to achieve 10%, 15%, and 20% weight reduction
- Significantly higher improvement in waist circumference, systolic BP, triglycerides, and HDL
- GI effects were most common, mostly mild/moderate

Not FDA approved for obesity.

Wharton S, et al. *N Engl J Med*. 2025;393:1796-1806.

Changes in PsA and Metabolic Measures After GLP-1 RA Therapy

Median changes in PsA and metabolic measure following GLP1-RA therapy

Variable	Median change (95% CI)	*P*-value*	N
Weight (kg)	–6.43 (–9.50 to –2.00)	< .0001	48
DAPSA	–3.52 (–8.62 to 2.77)	.11	21
CRP (mg/L)	–1.1 (–2.0 to –0.2)	.002	31
Tender joint count	0 (–1 to 0)	.29	45
Swollen joint count	0 (0 to 0)	.03	45
Pain (0–10)	–1.0 (–1.75 to 0)	.01	25
Patient global activity (0–10)	–0.5 (–1.67 to 0)	.08	23
HAQ-DI	–0.05 (–0.25 to 0.08)	.27	18
FACIT—fatigue	2.75 (–3.0 to 7.5)	.14	18
EuroQol 5-dimensions (0–1)	0.01 (0 to 0.14)	.14	18
BSA (%)	0.01 (0 to 1)	.56	45
Cholesterol (mmol/L)	–0.23 (–0.45 to 0.20)	.10	28
Triglycerides (mmol/L)	–0.35 (–0.71 to –0.13)	.02	28
ALT	–2.5 (–6 to 1)	.24	42
Systolic BP (mm/Hg)	0 (–4 to, 5)	.88	42

*Wilcoxon Signed-Rank test for paired samples.
ALT = alanine transaminase; BP = blood pressure; BSA = body surface area of psoriasis; CRP = C-reactive protein; DAPSA = Disease Activity Index in Psoriatic Arthritis; FACIT = Functional Assessment of Chronic Illness Therapy; HAQ-DI = Health Assessment Questionnaire Disability Index.

Eder L, et al. American College of Rheumatology (ACR) Convergence 2025; Abstract 2687 (https://acrabstracts.org/abstract/glucagon-like-peptide-1-receptor-agonists-therapy-is-associated-in-improvement-in-psoriatic-arthritis-related-and-metabolic-outcomes-a-retrospective-analysis-of-two-cohorts/). Accessed 3/2/26.

Mediterranean Diet and Psoriatic Disease (MEDIPSO)

JAMA Dermatology | Original Investigation

Mediterranean Diet and Patients With Psoriasis
The MEDIPSO Randomized Clinical Trial

Javier Perez-Bootello, MD; Emilio Berna-Rico, MD, PhD; Carlota Abbad-Jaime de Aragon, PhD; Leticia Goni, PhD; Zenaida Vazquez-Ruiz, MPH, PhD; Fernando Neria, PhD; Ruth Cova-Martin, MD; Jorge Naharro-Rodriguez, MD; Asuncion Ballester-Martinez, MD; Cristina Pindado-Ortega, MD; Diana Monge, PhD; Andrew Blauvelt, MD, MBA; Pedro Jaen, MD, PhD; Nehal Mehta, MD, MSCE; Joel M. Gelfand, MD, MSCE; Miguel A. Martinez-Gonzalez, MD, PhD; Álvaro Gonzalez-Cantero, MD, PhD

- Open-label, single-center, single-blinded (evaluator) RCT
- Adults with mild to moderate psoriasis (PASI 2–10) receiving stable topical therapy
- Randomized 1:1 16-week, dietitian-guided Mediterranean diet program vs standard low-fat dietary advice without dietitian supervision

Perez-Bootello J, et al. *JAMA Dermatol*. 2025;161:1215-1223.

Results From MEDIPSO Trial

- 38 participants enrolled and randomized

Outcome	Control (low-fat advice) (n = 18)	Mediterranean diet intervention (n = 19)	Between-group difference	*p*-value
PASI	0 (−1.0 to 1.0)	−3.4 (−4.4 to −2.4)	−3.4 (−4.8 to −2.0)	<.001
BSA	0.3 (−0.8 to 1.4)	−3.1 (−4.2 to −2.1)	−3.5 (−5.0 to −1.9)	<.001
DLQI	−1.1 (−3.1 to 0.9)	−4.2 (−6.1 to −2.2)	−3.1 (−5.8 to −0.3)	.03
Weight (kg)	−1.3 (−2.7 to 0.1)	−0.3 (−1.7 to 1.1)	1.0 (−1.0 to 3.0)	.31
HbA1C (mmol/mol)	2.3 (0.4 to 4.3)	−1.8 (−3.8 to 0.2)	−4.1 (−6.9 to −1.3)	.01
Lipoprotein(a)	2.4 (0 to 4.7)	−1.0 (−3.3 to 1.3)	−3.4 (−6.7 to −0.1)	0.4

MEDIPSO = Impact of the Mediterranean Diet on Patients With Psoriasis.

Perez-Bootello J, et al. *JAMA Dermatol*. 2025;161:1215-1223.

JAMA Dermatology | Original Investigation

Association Between Mediterranean Anti-inflammatory Dietary Profile and Severity of Psoriasis
Results From the NutriNet-Santé Cohort

Céline Phan, MD; Mathilde Touvier, MD, PhD; Emmanuelle Kesse-Guyot, MD, PhD; Moufidath Adjibade, MD, PhD; Serge Hercberg, MD, PhD; Pierre Wolkenstein, MD, PhD; Olivier Chosidow, MD, PhD; Khaled Ezzedine, MD, PhD; Emilie Sbidian, MD, PhD

- Observational, web-based questionnaire cohort study
- **Aim: Assess the association between a score that reflects the adhesion to a Mediterranean diet (MEDI-LITE) and the onset and/or severity of psoriasis**
- Psoriasis diagnosis and severity were self-reported
- 3557 psoriasis cases: 878 (24.7%) were severe and 299 (8.4%) were incident cases
- Higher adherence to MEDI-LITE associated with **lower odds of severe psoriasis** after adjustment for major confounders (including BMI and baseline cardiometabolic history)

Phan C, et al. *JAMA Dermatol*. 2018;154:1017-1024.

ABSTRACT NUMBER: 2690

Dietary interventions in Psoriatic Arthritis: A Randomized controlled clinical trial

Lihi Eder[1], Sohan Shahab[2], Sarah Hopkins Gillespie[3], Laura Bumbulis[4], Helen Emanoilidis[5], Charlene Compher[6], Jose Scher[7], Dafna D. Gladman[8], Richard Cook[4], Vinod Chandran[1] and Alexis Ogdie[9], [1]University of Toronto, Toronto, ON, Canada, [2]Women's

- Multicenter RCT
- Adults with **moderately active PsA (DAPSA >10), BMI 25 to 40**, and **stable drug therapy**, recruited from **3 centers**
- Randomized to

  (1) **Mediterranean diet** (healthy composition)

  (2) **A low-calorie Dietary Approaches to Stop Hypertension (DASH-LC)** (weight reduction)

  (3) **Control** with general, nonpersonalized dietary advice
- Primary outcome was **change in DAPSA at Week 12**

Eder L, et al. ACR Convergence 2025; Abstract 2690.

Results From the DIPSA Trial

- 92 patients randomized (Mediterranean diet n = 31; DASH-LC n = 30; control n = 31)
- 12 patients withdrew postrandomization

Both diets and standard advice led to
a modest weight loss and improved PsA activity.

The degree of weight loss (not the specific diet strategy) was the primary driver of clinical benefit.

Eder L, et al. ACR Convergence 2025; Abstract 2690.

Bariatric Surgery Improves PsO/PsA Outcomes

Hazard ratios for PsO and PsA in patients undergoing bariatric surgery

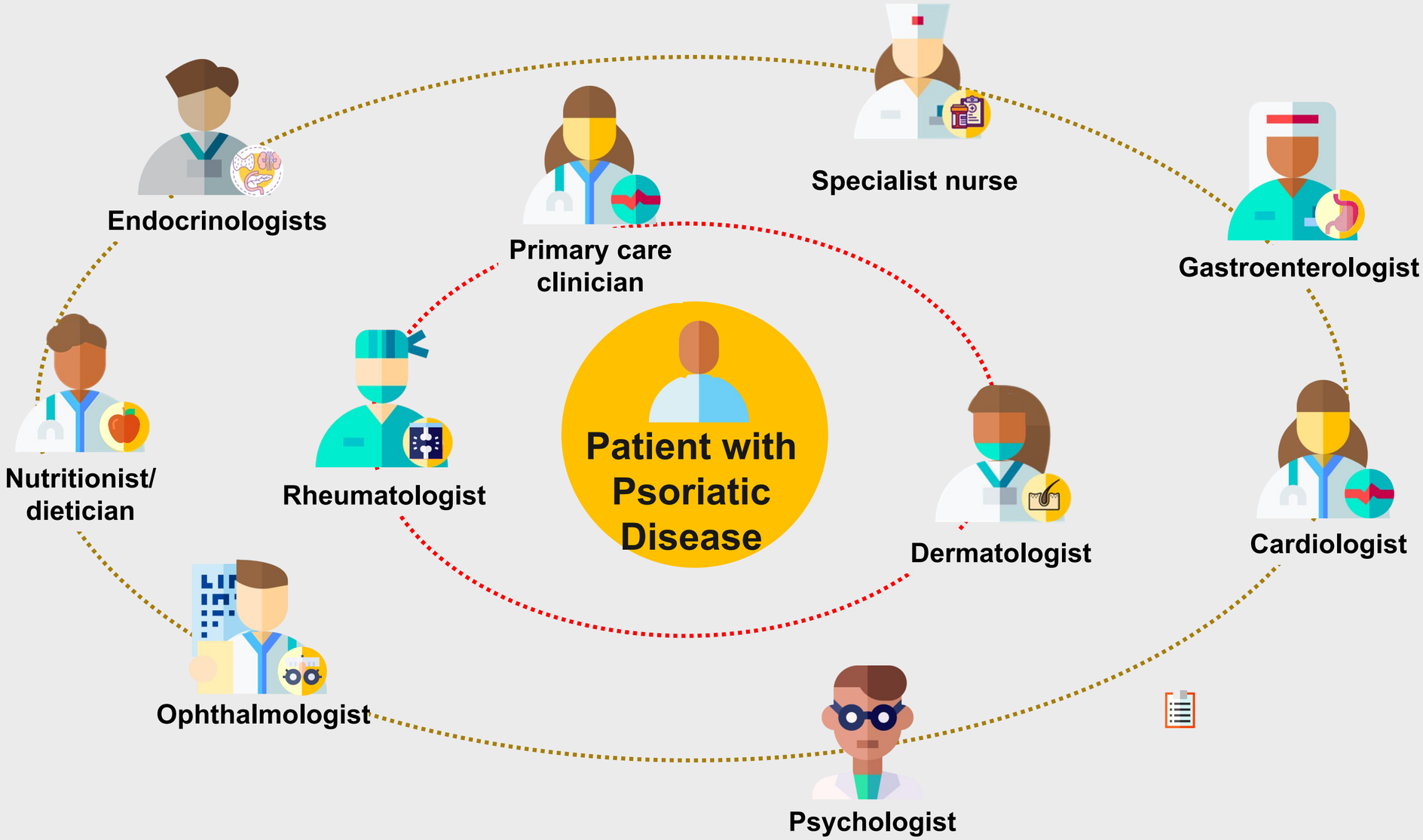
Crude and adjusted hazard ratios of psoriasis, severe psoriasis, and psoriatic arthritis in patients undergoing bariatric surgery

Characteristic	Crude		Age adjusted and sex adjusted		Fully adjusted*	
	Hazard ratio (95% CI)	*P*-value	Hazard ratio (95% CI)	*P*-value	Hazard ratio (95% CI)	*P*-value
Gastric bypass						
Any psoriasis	0.54 (0.34–0.84)	.006	0.52 (0.32–0.81)	.004	0.52 (0.33–0.81)	.004
Severe psoriasis	0.45 (0.23–0.88)	.02	0.44 (0.22–0.73)	.02	0.44 (0.23–0.86)	.02
Psoriatic arthritis	0.31 (0.13–0.76)	.01	0.30 (0.12–0.73)	.01	0.29 (0.12–0.71)	.01
Gastric banding						
Any psoriasis	1.42 (0.47–4.30)	.54	1.23 (0.41–3.74)	.71	1.23 (0.40–3.75)	.72
Severe psoriasis	1.32 (0.14–12.11)	.81	1.28 (0.14–11.85)	.83	1.18 (0.12–11.48)	.89
Psoriatic arthritis	0.62 (0.10–3.89)	.61	0.58 (0.09–3.68)	.57	0.53 (0.08–3.56)	.52

*** Fully adjusted considered age, sex, alcohol abuse, and socioeconomic, smoking, and diabetes status.**

Egeberg A, et al. *JAMA Surgery*. 2017;152:344-349. Sethi M, et al. *Surg Obes Relat Dis*. 2015;11(suppl 6):S64-S65.

The Multidisciplinary Team for Psoriatic Disease



Gratacós J, et al. *Joint Bone Spine*. 2021;88(3):105175.

Clinical Implications

Patients with psoriasis have increased visceral adiposity (fat surrounding internal organs), which is:

- Metabolically active
- Promotes insulin resistance, dyslipidemia, systemic inflammation, and atherosclerosis

Obesity is:

- A major driver of psoriasis morbidity
- A risk factor for developing plaque psoriasis (PsO) and PsA
- Associated with more severe skin involvement with PsO
- Associated with a reduced response to treatment and reduced persistence on biologics

Obesity needs to be addressed in the context of treating patients with psoriatic disease

Gelfand JM. *J Invest Dermatol*. 2025;145:2657-2658.