

PEDIATRIC PSORIASIS UPDATE

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- RESEARCH GRANTS PAID TO MEDICAL SCHOOL: LEO, DERMAVANT, ARCUTIS, ORTHO DERMATOLOGICS
- HONORARIA: PFIZER, DERMAVANT, ARCUTIS, LEO, ORTHO DERMATOLOGICS, MAYNE
- DSMB: SANOFI REGENERON, ORTHO DERMATOLOGICS, GSK



PEDIATRIC PSORIASIS

- MOST COMMON ANATOMIC SITES: SCALP, FACE, FLEXURES

Management Strategies for Pediatric Moderate-to-Severe Plaque Psoriasis: Spotlight on Biologics

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Pharmacokinetics and safety of **apremilast** in **pediatric** patients with moderate to severe plaque **psoriasis**: Results from a phase 2 open-label study.

Paller AS, Hong Y, Becker EM, de Lucas R, Paris M, Zhang W, Zhang Z, Barcellona C, Maes P, Fiorillo L.

J Am Acad Dermatol. 2020 Feb;82(2):389-397. doi: 10.1016/j.jaad.2019.08.019. Epub 2019 Aug 10.

PMID: 31408686 **Free article.** Clinical Trial.

EFFICACY AND SAFETY OF **APREMILAST** IN **PEDIATRIC** PATIENTS WITH MODERATE-TO-SEVERE PLAQUE **PSORIASIS**: 16-WEEK RESULTS FROM SPROUT, A RANDOMIZED CONTROLLED TRIAL.

Fiorillo L, Becker E, de Lucas R, Belloni-Fortina A, Armesto S, Elewski B, Maes P, Oberoi RK, Paris M, Zhang W, Zhang Z, Arkin L.

J Am Acad Dermatol. 2024 Jan 22:S0190-9622(24)00108-7. doi: 10.1016/j.jaad.2023.11.068. Online ahead of print.

PMID: 38266683

PEDIATRIC PSORIASIS THERAPY

Only **7 FDA medications approved** for pediatric patients

Biologics:

- Etanercept: ≥ 6 years
- Ustekinumab : ≥ 6 years approved for psoriatic arthritis in children
- Ixekizumab: ≥ 6 years
- Secukinumab: ≥ 6 years (May 2021)

PEDIATRIC PSORIASIS THERAPY

- **UP TO 20 % OF ALL CHILDHOOD ARTHRITIS IS PSORIATIC ARTHRITIS**
- **IF A CHILD HAS PSORIATIC ARTHRITIS, ASSESS FOR UVEITIS**
- **ADALIBUMAB:**
 - **NOT APPROVED IN USA FOR PEDI PSORIASIS**
 - **IS APPROVED DOWN TO 2 YEARS OF AGE FOR UVEITIS**

PEDIATRIC PSORIASIS THERAPY

Only **7 FDA medications approved** for pediatric patients

Topicals: Roflumilast: PDE 4 inhibitor: ≥ 6 years

- - used systemically in COPD in adults
- Calcipotriene Foam 0.005%: ≥ 4 years scalp and body
- Calcipotriene 0.005% and betamethasone 0.064% **foam** or **ointment**
 ≥ 12 years: mild to severe plaque psoriasis
- Calcipotriene 0.005% and betamethasone 0.064% **suspension**: scalp and body: ≥ 12 years

Topical roflumilast

INVESTIGATOR GLOBAL ASSESSMENT AT 8 WEEKS

Patients aged \geq 2 years with 2 to 20% BSA psoriasis

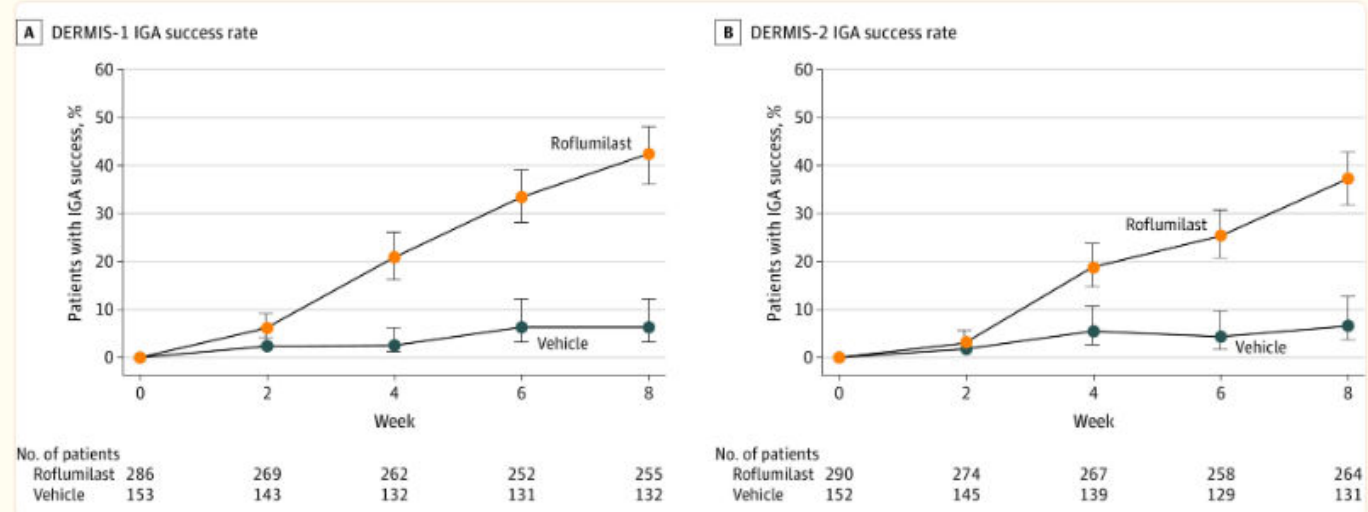


Figure 2.

Percentage of Patients Achieving IGA Success Over Time in DERMIS-1 and DERMIS-2



JAMA
View Article ▶

JAMA. 2022 Sep 20; 328(11): 1073–1084.
Published online 2022 Sep 20. doi: [10.1001/jama.2022.15632](https://doi.org/10.1001/jama.2022.15632)

PMCID: PMC9490499
PMID: [36125472](https://pubmed.ncbi.nlm.nih.gov/36125472/)

Effect of Roflumilast Cream vs Vehicle Cream on Chronic Plaque Psoriasis

... The DERMIS-1 and DERMIS-2 Randomized Clinical Trials

Methotrexate for inflammatory skin disease in pediatric patients: Consensus treatment guidelines.

Siegfried EC, Arkin LM, Chiu YE, Hebert AA, Callen JP, Castelo-Soccio L, Co DO, Cordoro KM, Curran ML, Dalrymple AM, Flohr C, Gordon KB, Hanna D, Irvine AD, Kim S, Kirkorian AY, Lara-Corrales I, Lindstrom J, Paller AS, Reyes M, Begolka WS, Tom WL, Van Voorhees AS, Vleugels RA, Lee LW, Davies OMT, Brandling-Bennett HA.

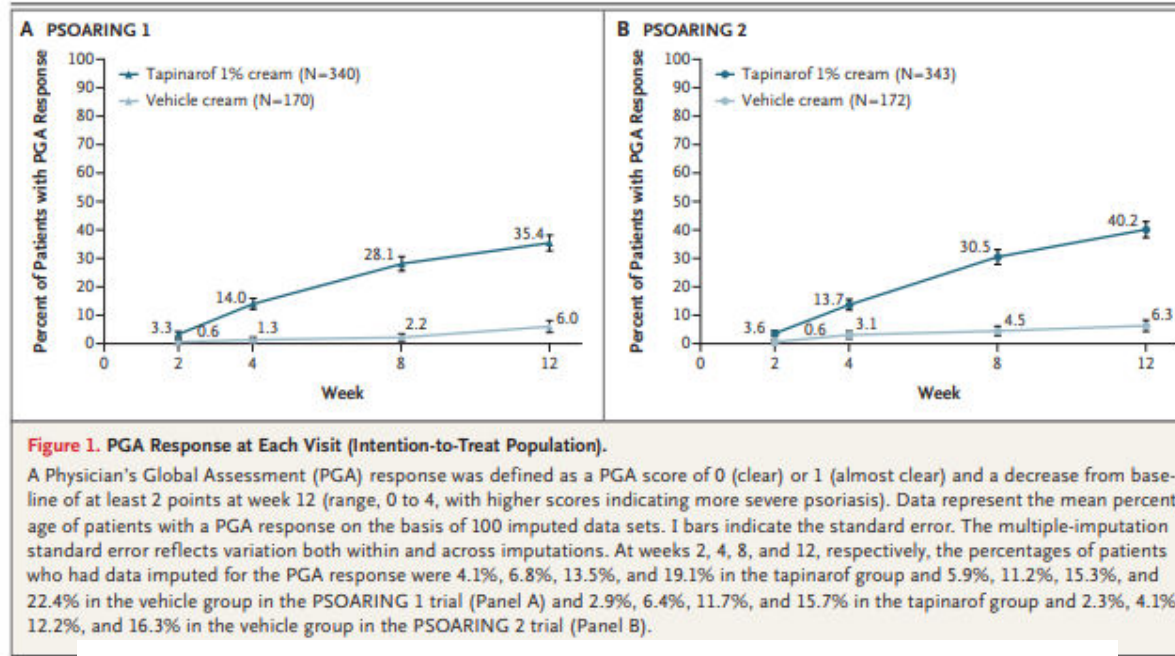
Pediatr Dermatol. 2023 Sep-Oct;40(5):789-808. doi: 10.1111/pde.15327. Epub 2023 Jun 14.

PMID: 37316462

Tapinarof

PHYSICIAN GLOBAL ASSESSMENT AT 12 WEEKS

Approved for
psoriasis in patients
≥ 18 years of age



The **NEW ENGLAND**
JOURNAL *of* **MEDICINE**

ESTABLISHED IN 1812

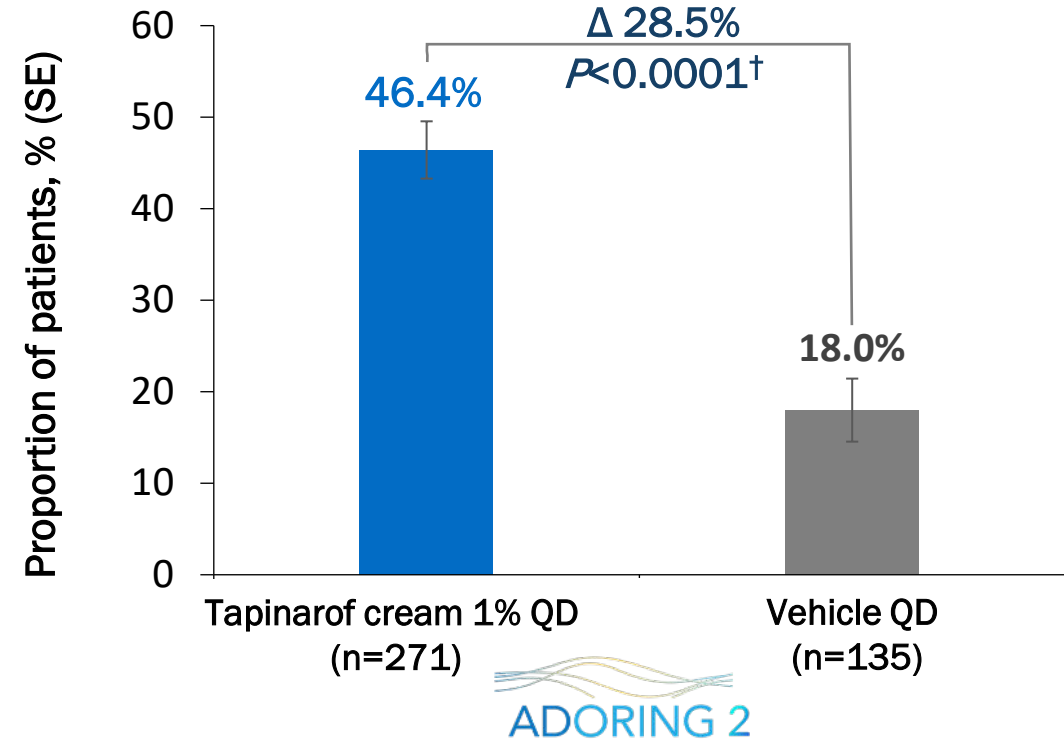
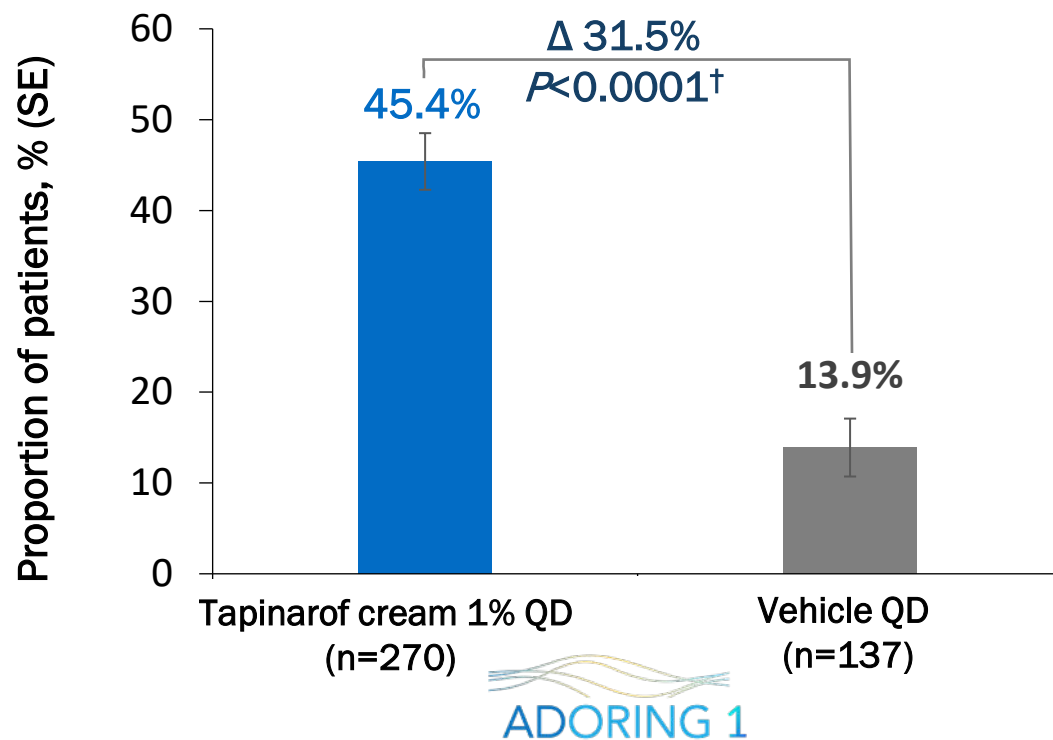
DECEMBER 9, 2021

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Phase 3 Trials of Tapinarof Cream for Plaque Psoriasis

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April W. Armstrong, M.D., Jerry Bagel, M.D., Leon Kircik, M.D., Benjamin Ehst, M.D., Ph.D., H. Chih-ho Hong, M.D.,
Jennifer Soung, M.D., Jeff Fromowitz, M.D., Scott Guenther, M.D., Stephen C. Piscitelli, Pharm.D.,
David S. Rubenstein, M.D., Ph.D., Philip M. Brown, M.D., J.D., Anna M. Tallman, Pharm.D., and Robert Bissonnette, M.D.

Tapinarof Cream 1% QD: Primary Endpoint of **ATOPIC DERMATITIS** vIGA-AD™ Response* at Week 8 was Achieved in Both Trials



vIGA-AD™ response* was highly statistically significant with tapinarof cream 1% QD versus vehicle in both ADORING 1 & 2: 45.4% vs 13.9% and 46.4% vs 18.0% (both $P<0.0001$), respectively

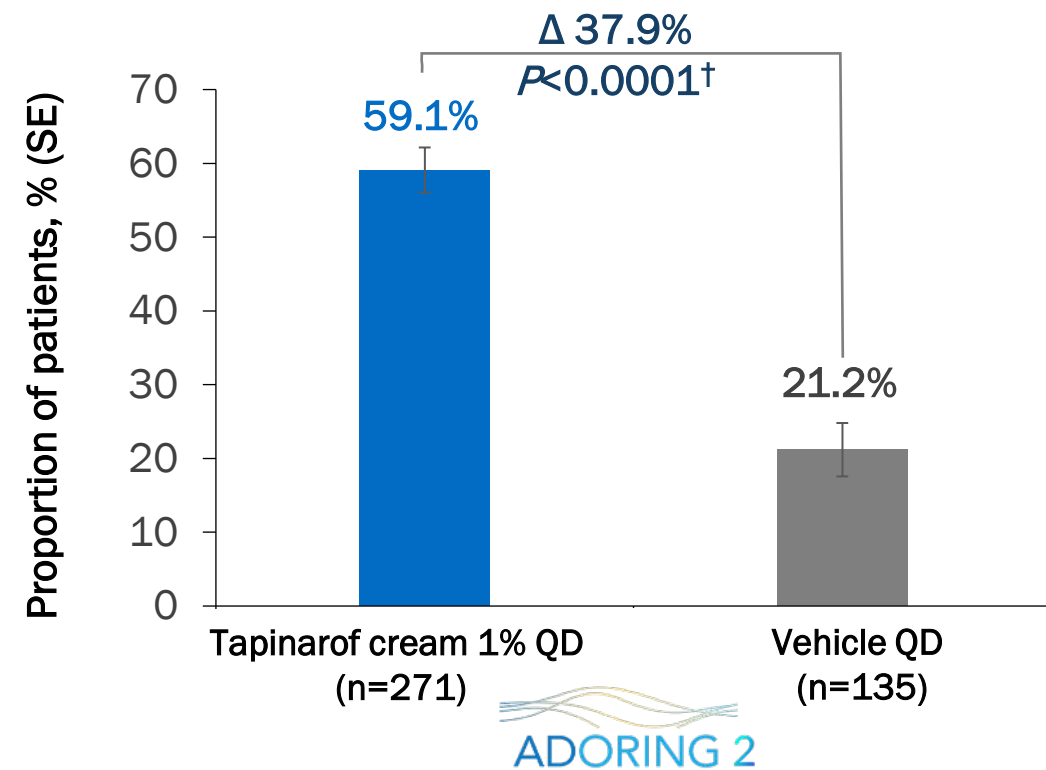
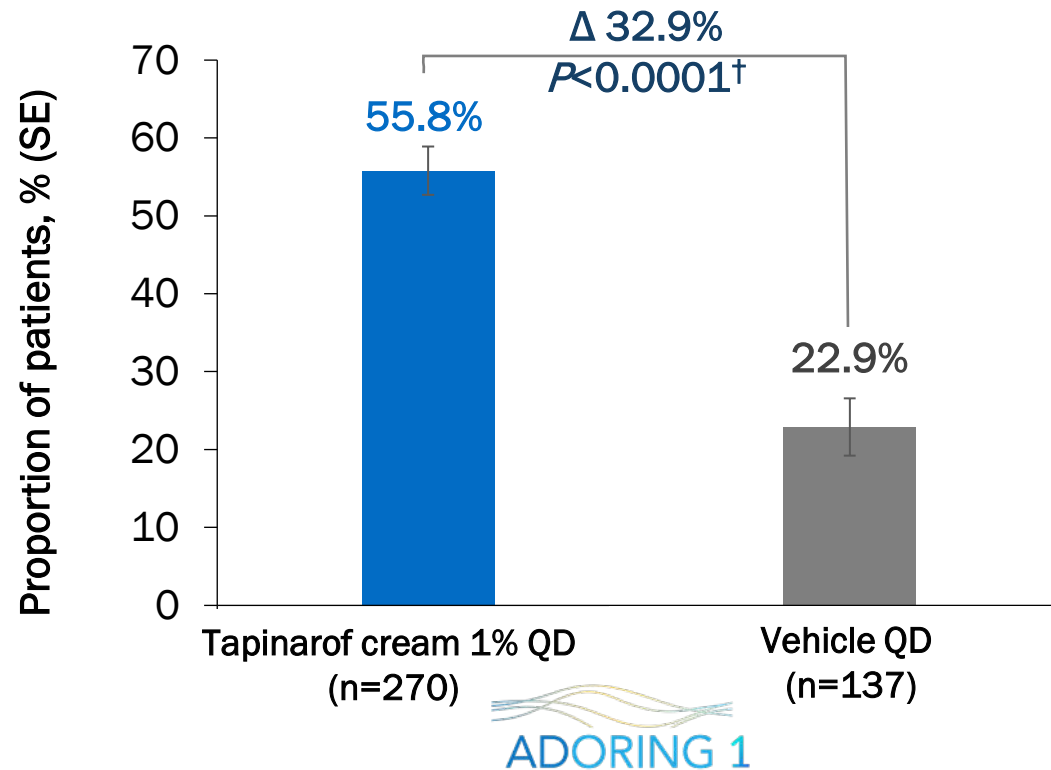
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*vIGA-AD™ score of 0 or 1 and ≥2-grade improvement from baseline. †P value based upon Cochran-Mantel-Haenszel analysis stratified by baseline vIGA-AD™ score and age group.

Intention-to-treat, multiple imputation.

QD, once daily; SE, standard error; vIGA-AD™, Validated Investigator Global Assessment for Atopic Dermatitis™.

Tapinarof Cream 1% QD: Secondary Endpoint of **ATOPIC DERMATITIS** EASI75 Response* at Week 8 was Achieved in Both Trials

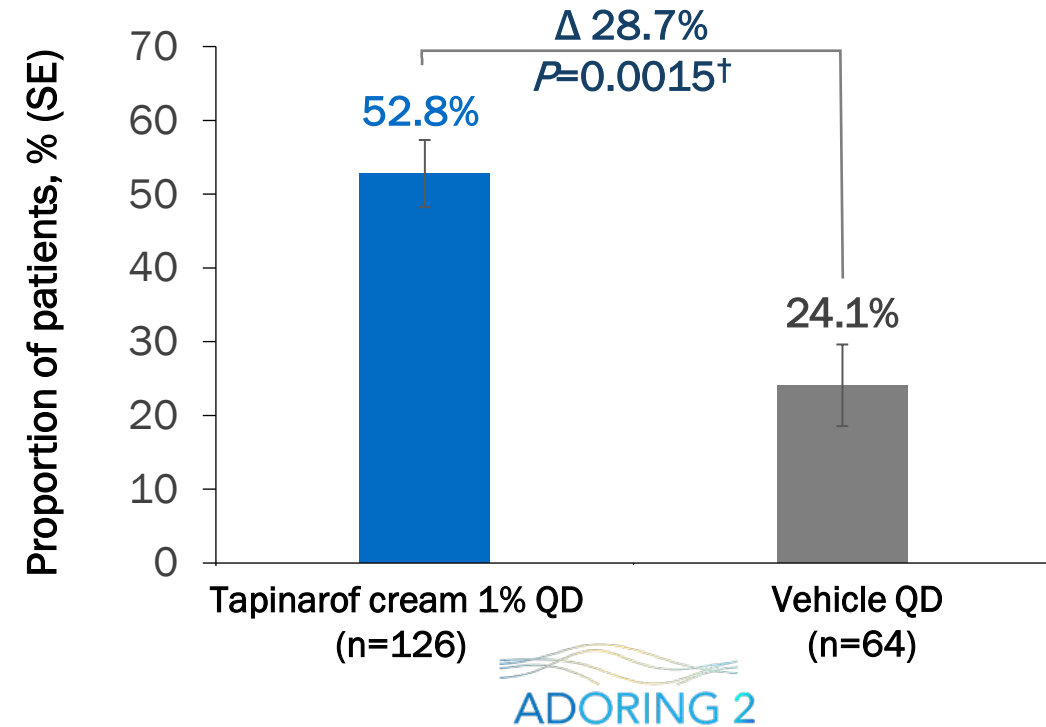
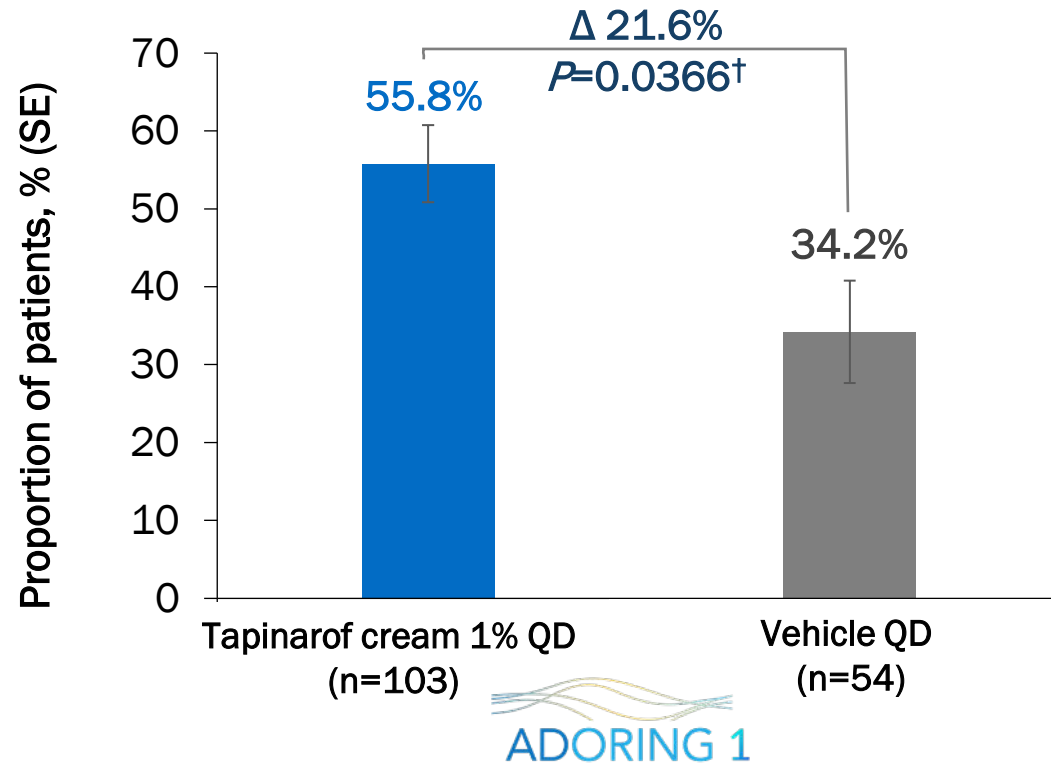


EASI75 response* at Week 8 was highly statistically significant in the tapinarof cream 1% QD group versus vehicle in both ADORING 1 and 2: 55.8% vs 22.9% and 59.1% vs 21.2% (both $P < 0.0001$), respectively

* $\geq 75\%$ improvement in Eczema Area and Severity Index score from baseline. $^\dagger P$ value based upon Cochran-Mantel-Haenszel analysis stratified by baseline vIGA-AD™ score and age group. Intention-to-treat, multiple imputation. EASI75, $\geq 75\%$ improvement in Eczema Area and Severity Index score; QD, once daily; SE, standard error; vIGA-AD™, Validated Investigator Global Assessment for Atopic Dermatitis™.

Tapinarof Cream 1% QD: PP-NRS Response* (Patients Aged ≥12 Years) at Week 8 was Achieved in Both Trials

ATOPIC DERMATITIS



PP-NRS response* (patients aged ≥12 years) at Week 8 was statistically significant in the tapinarof cream 1% QD group versus vehicle in both ADORING 1 and 2: 55.8% vs 34.2% (P=0.0366) and 52.8% vs 24.1% (P=0.0015), respectively


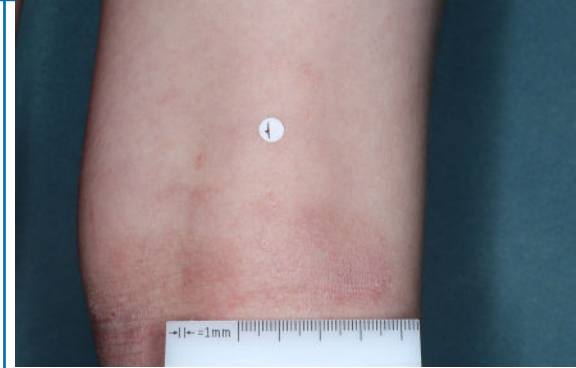
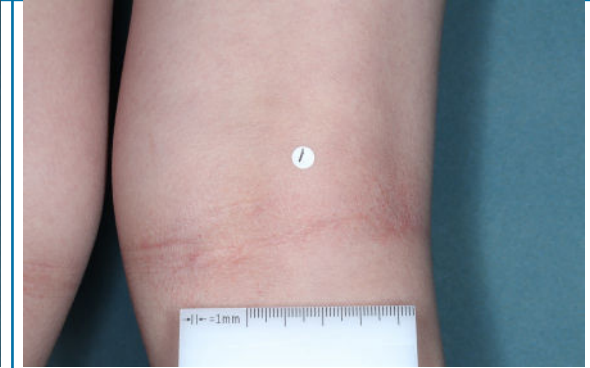

*≥4-point reduction in the average weekly PP-NRS total score from baseline. †P value based upon Cochran-Mantel-Haenszel analysis stratified by baseline vIGA-AD™ score and age group.

Intention-to-treat, multiple imputation.

PP-NRS, Peak Pruritus Numerical Rating Scale; QD, once daily; SE, standard error; vIGA-AD™, Validated Investigator Global Assessment for Atopic Dermatitis™.

8-Year-Old Patient with Moderate AD Treated with Tapinarof Cream 1% QD Who Achieved the Primary Endpoint as Early as Week 2 and Complete Resolution of Itch at Week 8

ATOPIC DERMATITIS

BASELINE	WEEK 2	WEEK 4	WEEK 8
			
<ul style="list-style-type: none">• vIGA-ADTM=3 • EASI=6.5• PP-NRS=9	<ul style="list-style-type: none">• vIGA-ADTM=1 • EASI=3.0• PP-NRS=4.6	<ul style="list-style-type: none">• vIGA-ADTM=1 • EASI=0.3• PP-NRS=3.7	<ul style="list-style-type: none">• vIGA-ADTM=1 • EASI=0.9• PP-NRS=0.3

- Patient (aged 8 years) with moderate disease (vIGA-ADTM=3) at baseline who achieved almost clear skin (vIGA-ADTM=1) by Week 2
- Patient also had severe itch (PP-NRS=9) at baseline, achieving a clinically meaningful ≥ 4 -point reduction in PP-NRS by Week 2, with improvement to an itch-free state by Week 8 (PP-NRS=0.3)

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Example of one representative target lesion in a tapinarof-treated patient from the ADORING 2 clinical trial. Individual results may vary.

AD, atopic dermatitis; EASI, Eczema Area and Severity Index; PP-NRS, Peak Pruritus Numerical Rating Scale; QD, once daily; vIGA-ADTM, Validated Investigator Global Assessment for Atopic DermatitisTM.

AAD PEDIATRIC PSORIASIS GUIDELINES

Joint American Academy of Dermatology—National Psoriasis Foundation guidelines of care for the management and treatment of psoriasis in pediatric patients



Alan Menter, MD (Co-Chair),^a Kelly M. Cordoro, MD,^b Dawn M. R. Davis, MD,^c
Daniela Kroshinsky, MD, MPH,^d Amy S. Paller, MD,^e April W. Armstrong, MD, MPH,^f Cody Connor, MD,^g
Boni E. Elewski, MD,^h Joel M. Gelfand, MD, MSCE,^h Kenneth B. Gordon, MD,ⁱ Alice B. Gottlieb, MD, PhD,^j
Daniel H. Kaplan, MD, PhD,^k Arthur Kavanaugh, MD,^l Matthew Kiselica, BA/BS,^m Dario Kivelevitch, MD,^a
Neil J. Korman, MD, PhD,ⁿ Mark Lebwohl, MD,^o Craig L. Leonardi, MD,^p Jason Lichten, MD,^m
Henry W. Lim, MD,^q Nehal N. Mehta, MD, MSCE,^r Sylvia L. Parra, MD,^s Arun L. Pathy, MD,^t
Elizabeth A. Farley Prater, MD,^u Reena N. Rupani, MD,^o Michael Siegel, PhD,^v Benjamin Stoff, MD, MA,^w
Bruce E. Strober, MD, PhD,^{x,y} Emily B. Wong, MD,^z Jashin J. Wu, MD,^{aa} Vidhya Hariharan, PhD,^{bb}
and Craig A. Elms, MD (Co-Chair)^g

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Los Angeles, California; Birmingham, Alabama; Philadelphia, Pennsylvania; Milwaukee, Wisconsin; New
York, New York; Pittsburgh, Pennsylvania; San Diego, California; Cleveland, Ohio; St Louis, Missouri;
Detroit, Michigan; Bethesda, Maryland; Sumter, South Carolina; Centennial, Colorado; Oklahoma City,
Oklahoma; Indianapolis, Indiana; Atlanta, Georgia; Cromwell and New Haven, Connecticut; San
Antonio, Texas; Irvine, California; and Rosemont, Illinois*

PEDIATRIC PSORIASIS

- A CHRONIC, MULTISYSTEM INFLAMMATORY DISEASE THAT AFFECTS 1% OF CHILDREN
- MOST COMMON TIME OF ONSET: ADOLESCENCE
- ONE THIRD OF CASES OF PSORIASIS START IN CHILDHOOD
- MULTIPLE COMORBIDITIES: **PSORIATIC ARTHRITIS** HAS LARGEST EVIDENCE BASE

AAD GUIDELINES:Journal American Academy of Dermatology 2020

COMORBIDITIES IN PEDI PSORIASIS

- **PSORIATIC ARTHRITIS**
- OBESITY
- HYPERLIPIDEMA
- DIABETES MELLITUS
- RHEUMATOID ARTHRITIS
- INFLAMMATORY BOWEL DISEASE



➤ [JAMA Dermatol. 2017 Jul 1;153\(7\):698-704. doi: 10.1001/jamadermatol.2017.0499.](#)

Pediatric Psoriasis Comorbidity Screening Guidelines

Emily Osier¹, Audrey S Wang², Megha M Tollefson³, Kelly M Cordoro⁴, Stephen R Daniels⁵, Andrew Eichenfield⁶, Joel M Gelfand⁷, Alice B Gottlieb⁸, Alexa B Kimball⁹, Mark Lebwohl¹⁰, Nehal N Mehta¹¹, Amy S Paller¹², Jeffrey B Schwimmer¹³, Dennis M Styne¹⁴, Abby S Van Voorhees¹, Wynn L Tom¹⁵, Lawrence F Eichenfield¹⁵

Affiliations + expand

PMID: 28514463 PMCID: [PMC5748031](#) DOI: [10.1001/jamadermatol.2017.0499](#)

[Free PMC article](#)

**PSORIATIC ARTHRITIS:
SCREEN FOR UVEITIS**



children



[Children \(Basel\)](#). 2021 Nov; 8(11): 1057.

PMCID: PMC8619705

Published online 2021 Nov 16. doi: [10.3390/children8111057](https://doi.org/10.3390/children8111057)

PMID: [34828770](https://pubmed.ncbi.nlm.nih.gov/34828770/)

Skin Disease in Children: Effects on Quality of Life, Stigmatization, Bullying, and Suicide Risk in Pediatric Acne, Atopic Dermatitis, and Psoriasis Patients

[Katherine A. Kelly](#),^{1,*} [Esther A. Balogh](#),¹ [Sebastian G. Kaplan](#),² and [Steven R. Feldman](#)^{1,3,4,5}

The Crutchfield-Brownstone-Lebwohl

Biologic Medication Quick Reference Sheet for Psoriasis

Brand Name	Generic Name	Ages	Loading Dose	Maintenance Dose	TNF	IL-4	IL-12	IL-13	IL-17	IL-23
Enbrel*	Etanercept	PsA 18 yrs + PsO 4 yrs +	50 mg SQ Twice Weekly for 12 wks PEDS: 0.8 mg/kg q wk (max-dose 50 mg q wk)	50 mg SQ q wk	✓					
Humira*	Adalimumab	PsO / PsA 18 yrs +	80 mg SQ on Day 1 and then 40 mg SQ on Day 8	40 mg SQ q2 wks	✓					
Remicade*	Infliximab	PsO / PsA 18 yrs +	5 mg/kg IV wk 0, 2, and 6	5 mg/kg IV q8 wks	✓					
Cimzia*	Certolizumab Pegol	PsO / PsA 18 yrs +	>90 kg: No Loading Dose <90 kg: 400 mg SQ at wk 0, 2 and 4	400 mg SQ q2 wks 200 mg SQ q2 wks	✓					
Stelara*	Ustekinumab	PsO 6 yrs + PsA 18 yrs +	<100 kg: 45 mg SQ at wk 0 and 4 >100 kg: 90 mg SQ at wk 0 and 4 PEDS: Weight-based dosing recommended at initial dose, 4 weeks later, then q12 weeks. Less than 60 kg = 0.75 mg/kg 60 kg to 100 kg = 45 mg Greater than 100 kg = 90 mg	45 mg SQ q12 wks 90 mg SQ q12 wks			✓			✓
Cosentyx*	Secukinumab	PsA 2 yrs + PsO 6 yrs +	300 mg SQ at wk 0, 1, 2, 3, and 4 PEDS: Dosage based on body weight and administered by SQ at wks 0, 1, 2, 3, and 4 and q4 wks Less than 50 kg = 75 mg Greater than or equal to 50 kg = 150 mg	300 mg SQ q4 wks					✓	
Taltz*	Ixekizumab	PsA 18 yrs + PsO 6 yrs +	160 mg at wk 0, then 80 mg at wk 2, 4, 6, 8, 10, and 12 PEDS: Greater than 50 kg = 160 mg at wk 0 then 80 mg q4 wks 25 to 50 kg = 80 mg at wk 0 then 40 mg q4 wks Less than 25 kg = 40 mg at wk 0 then 20 mg q4 wks	80 mg SQ q4 wks					✓	
Siliq	Brodalumab	PsO 18 yrs +	210 mg SQ at wk 0, 1, and 2	210 mg SQ q2 wks					✓	
Tremfya*	Guselkumab	PsO / PsA 18 yrs +	100 mg SQ at wk 0 and 4	100 mg SQ q8 wks						✓
Ilumya	Tildrakizumab	PsO 18 yrs +	100 mg SQ at wk 0 and 4	100 mg SQ q12 wks						✓
Skyrizi*	Risankizumab	PsO / PsA 18 yrs +	150 mg SQ at wk 0 and 4	150 mg SQ q12 wks						✓

PEDIATRIC PSORIASIS THERAPY

- Only **5 FDA medications approved** for pediatric patients

(one listed = different formulation)

- **Biologics:**

- Etanercept: ≥ 6 years
- Ustekinumab : ≥ 6 years
- Ixekizumab: ≥ 6 years
- Secukinumab: ≥ 6 years (May 2021)

- **Topicals:** Roflumilast cream 0.3% ≥ 6 years

- Calcipotriene Foam 0.005%: ≥ 4 years scalp and body
- Calcipotriene 0.005% and betamethasone 0.064% **foam**:
 ≥ 12 years: mild to severe plaque psoriasis
- Calcipotriene 0.005% and betamethasone 0.064%
suspension: scalp and body: ≥ 12 years

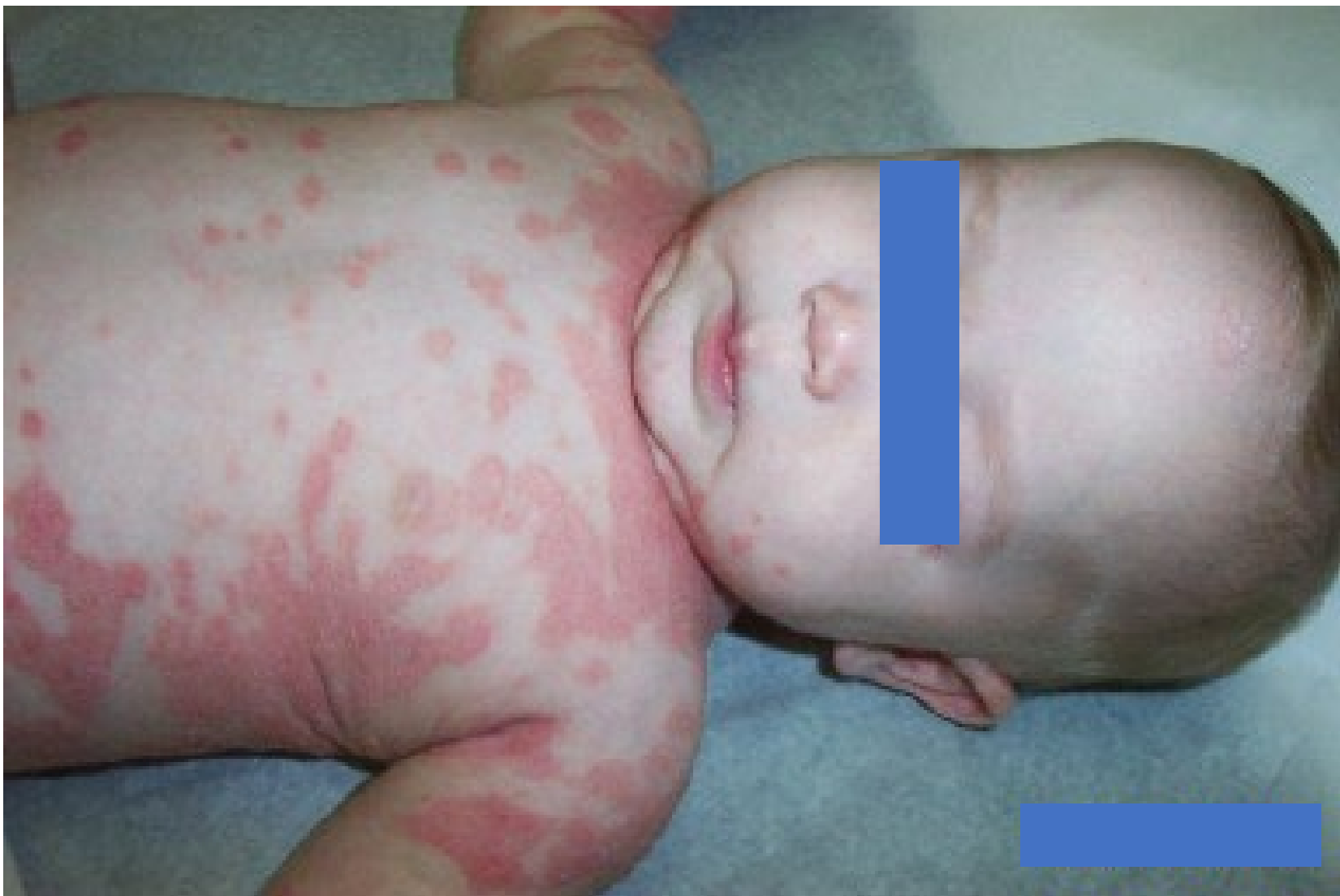
Mimickers of Pediatric Psoriasis

Mimickers:

Sodium valproate-induced psoriasiform drug eruption

Sanitizing hand and diaper wipes containing:

- Methylchlorothiazolinone
- periorificial or perineal psoriasiform distribution







CONCLUSION

- MANY CHALLENGES WHEN MANAGING PEDIATRIC PSORIASIS
- FAR FEWER MEDICATIONS
- REMEMBER COMORBIDITIES
- NAIL DISEASE: WORSE PROGNOSIS