Improving pediatric atopic dermatitis care in the emergency department and primary care setting: a collaborative quality improvement pilot project

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Abstract

Emergency department visits and healthcare expenditures for pediatric atopic dermatitis have been increasing over the last two decades. There is a paucity of replicable quality improvement initiatives addressed at educating primary care and emergency medicine clinicians on this condition. The goal of this initiative was to improve clinician knowledge and comfort in the diagnosis and management of pediatric atopic dermatitis and superinfection. Clinicians were recruited via email from academic and community settings in Travis County, Texas, in 2020. They were sent a pre-intervention survey, a series of three quizzes, and a post-intervention survey. After each quiz, participants received performance feedback and various forms of multimodal education. Differences between the first and final quiz scores and clinician confidence levels were analyzed for statistical significance. Fifty-six clinicians completed the intervention. The average overall and treatment-specific scores increased significantly by 10% and 37%, respectively. Further, confidence levels improved significantly in the majority of clinicians. Clinician qualitative feedback revealed high satisfaction. Results from this educational quality improvement project have demonstrated that this is an effective and replicable resource for educating clinicians who manage pediatric atopic dermatitis in the emergency department and outpatient setting.

Keywords: clinician, eczema, education, pediatric

Introduction

Atopic dermatitis (AD) is the most common pediatric inflammatory skin disorder with an estimated prevalence of 16.5% in the United States [1]. Over the last two decades, the rate of emergency department (ED) visits for AD has increased significantly, and the total healthcare spending on this diagnosis has more than doubled [2]. Unfortunately, many emergency medicine (EM) clinicians lack the training and confidence to manage these patients. A recent survey found that only 27% of EM physicians reported feeling extremely comfortable managing AD [3]. In addition, AD was found to be the most common dermatologic diagnosis provided upon review of pediatric dermatology ED consultations [4-5].

Atopic dermatitis is even more prevalent in primary care settings, as most children with AD will be managed by their primary care clinician [6]. This is in part related to the relative shortage of pediatric dermatologists and lengthy appointment wait times [7]. Unfortunately, only a minority of pediatricians have had clinical dermatology experience during their training and previous research demonstrated that pediatricians tend to undertreat AD with weak topical corticosteroids and inadequate use of non-

steroidal agents [8]. This may lead to more frequent flares and increased utilization of the ED. A survey of primary care physicians revealed that 89% of participants requested further education on AD treatment [9].

There is a paucity of data on the utility of quality improvement (QI) initiatives aimed at educating EM and primary care clinicians on diagnosing and management of AD. Discussions with community and academic EM clinicians as well as pediatric dermatologists receiving referrals demonstrated an interest in AD education. Clinicians requested a standardized AD algorithm and guidelines on appropriate referral practices.

A multispecialty team of trainees and faculty from the departments of pediatric dermatology, pediatric EM, and general pediatrics collaborated to create a multimodal educational QI project targeting EM and pediatric primary care clinicians. The primary goal of this initiative was to improve clinician knowledge and comfort in diagnosis, treatment, and referral practices of AD and superinfection. The secondary goal of this project was to provide clinicians with educational resources and point-of-care reference materials developed to guide clinical decision-making and provide a standardized management strategy for AD. Lastly, we aimed to create standardized home-care instructions, both in paper and video format, for patients and families.

Methods

Pediatric, family medicine and EM clinicians (attending physicians, resident and fellow physicians, nurse practitioners, physician assistants) were recruited via email from academic and community settings in Travis County, Texas, over a 3-month enrollment period in 2020. The surveys and quizzes employed in this project were created and accessed through the Research Electronic Data Capture (REDCap) software. Eligible participants first completed a pre-intervention entry survey (**Appendix A**) which obtained consent, demographics (level of training, years in practice, dermatology elective experience, practice setting), and baseline comfortability in aspects of AD management using a Likert scale from 1-5 (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). Participants were asked to assess how much they agreed or disagreed with statements about their perceived personal abilities in managing AD, including diagnosis, treatment, specialist referral practices, and gentle skin care counseling.

Following this, a series of three quizzes, each containing 10 different multiple-choice questions (**Appendix A**), were emailed or sent via mobile text message to all participants sequentially every two weeks. Each quiz contained three questions on diagnosis, three questions on treatment, three questions on referral practices, and one question on gentle skin care. Each quiz took about three minutes to complete. The quizzes were designed primarily by the dermatology team members and questions were based on standard-of-care guidelines. The use of open access photos was employed in the majority of questions. At the end of each quiz a free-text box was present for participants to request further education on AD topics in which they were least comfortable. After completing a quiz, participants were notified of their subscores in each domain and were shown their incorrect answers with explanations. If they used the free-text box to ask specific questions, a personalized email was sent with answers and tailored feedback. The quizzes closed one week after being released to participants at which time the data was analyzed by the study team. The overall scores for each domain were calculated and targeted AD education was delivered to participants via an email that also contained quiz feedback, tips based on the most frequent incorrect answers, and a point-of-care educational tool. The participants had one week to review this material prior to the start of the next quiz. After the final quiz, participants were prompted to complete a post-intervention exit survey (**Appendix A**) gauging confidence in AD management. Then, the last set of educational materials was delivered. See **Figure 1** for flow diagram of the intervention timeline.

Three main educational tools were created and distributed in this project, one after each quiz. The first resource distributed was the "Dell Children's

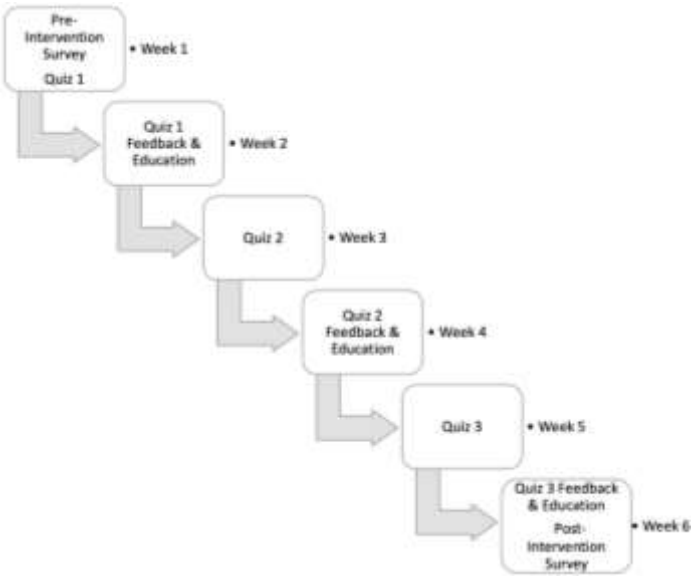

Figure 1. *Flow diagram of our intervention timeline.*

Evidence-Based Outcomes Center Atopic Dermatitis Guideline and Clinical Pathway" [10]. Created by the members of the study team and made publicly available online, this resource provides evidence-based information about AD and superinfection including an algorithmic decision tree that guides clinicians through the diagnosis and management of AD. Supplemental materials in the pathway include a pictorial atlas illustrating AD of differing severities across skin tones, resources for prescribing appropriate corticosteroids, antibiotic and antiviral therapy tables, and dermatology referral or consultation recommendations. After the second quiz, participants were sent a group of four "Atopic Dermatitis Five Minute Pearl" instructional videos created by the study team and published to YouTube (**Appendix B**). Each video focuses on a different aspect of AD care including diagnosis and superinfection, topical corticosteroid treatment, treatment of itch and superinfection, and gentle skin care and avoidance of triggers. The participant was instructed to either watch all videos or select one video that addressed their weakest area of AD knowledge based on quiz performance. After the third quiz, the final resource distributed was AD educational materials, including handouts created in both English and Spanish with a Quick Response code to an instructional video on AD designed for patients and families (**Appendix C**). Finally, a post-intervention survey asking the same questions regarding confidence and comfortability with AD as the pre-intervention survey was sent to participants (**Appendix A**).

We assessed the impact of our intervention by evaluating for change in clinician AD knowledge and confidence before and after the intervention. Only those that answered all questions on all three quizzes along with the pre-and post-interventions surveys were included in the analysis. The change in overall score and domain-specific scores (diagnosis, treatment, referral, gentle skin care) was calculated and analyzed for significance with the Wilcoxon rank-sum test. Subgroup analysis was performed for the variables of training level, dermatology elective experience, primary practice setting, and number of years in practice. The Wilcoxon rank-sum test was used to analyze data based on dermatology elective experience and primary practice setting, whereas the Kruskal-Wallis test was used for the variable of training level. Lastly, the effect of years in practice on scores was analyzed with a nonparametric trend test. The Likert score confidence changes were analyzed at the subject level with the Sign Rank test.

This project was submitted to the University of Texas Institutional Review Board and was considered exempt.

Results

In total, 190 participants demonstrated initial interest by completing our entry survey through the public link. Out of those, 56 fell into the following criteria for inclusion in our study: identified as a clinician in the field of general pediatric medicine, family medicine, or emergency medicine and completed all project surveys (pre- and post-intervention as well as three quizzes) in full. Data from these participants was analyzed and included in the results. Most participants were attending physicians (75%) in an outpatient practice (61%). There was a wide range of experience with 20% of participants having practiced for less than five years post-training and 22% with more than twenty years in practice. Forty-five percent did not have prior dermatology elective experience during training. See **Table 1** for further demographic data.

Averaged total quiz scores across all participants showed a 10% (P<0.001) improvement after completing the intervention. Furthermore, there was a statistically significant improvement of 36.91% (P<0.001) in the AD treatment-specific knowledge scores. There was no statistical difference in score changes with subgroup analysis for level of training, prior dermatology elective experience, number of years in practice, and primary practice location. However, there was a trend towards increased improvement for those with more years of experience and for those practicing in the community setting, both of which approached, but did not reach statistical significance (P=0.09 and P=0.11 respectively). See **Table 1**.

Data from pre- and post-intervention surveys revealed that the majority of participants, 66%, demonstrated improved confidence with AD management after completing the intervention (P<0.001), (**Table 2**). Qualitative feedback elicited through email after completion of the project demonstrated high acceptability amongst participants (**Table 3**).

Discussion

This educational QI intervention was successful at improving pediatric primary care and EM clinicians' knowledge and confidence with the management of AD. Participants demonstrated a statistically significant improvement in overall scores and treatment-specific scores after completing the intervention. In addition, the majority of participants demonstrated a significant improvement in confidence and comfortability with the diagnosis and management of AD.

Although none of the subgroup analyses met statistical significance, there were trends toward significance that are noteworthy. First, clinicians with more years of experience demonstrated lower initial scores and increased score improvements compared to those with less years of experience. This may suggest that clinicians who are further from training would benefit from continuing AD education to refresh their knowledge and familiarize themselves with changes in guidelines. Additionally, outpatient clinicians had higher baseline scores and increased improvement when compared to urgent care/hospital clinicians. This may be explained by the fact that community clinicians tend to manage AD independently more often whereas EM clinicians may rely on dermatology consultations available in the hospital.

The majority of participants demonstrated statistically significant increased confidence levels in the diagnosis and management of AD after completing the intervention; however confidence measures did not change in 16% of participants. Post-intervention feedback revealed that many clinicians were surprised by the complexity of AD and were unaware that they had impressive knowledge gaps. This may have led to artificially elevated pre-intervention confidence scores that were unlikely to improve after this period of self-reflection.

An intervention's acceptability and feasibility are key to success and longevity. These factors were enhanced by our intervention's virtual format. In a survey of over 1,000 physicians, 84% preferred to receive continuing education online and 80% believed that the greatest benefit of virtual education was access to on-demand content for later review [11]. Similar sentiments were expressed from participants in this project (**Table 3**). Satisfaction amongst participants was high and the intervention was deemed to be very useful for clinical practice. In addition, participants appreciated the ability to complete quizzes and receive educational materials easily through their cell phones—many voiced that this was key to implementation of changes into their clinical practices. Given that the intervention was completely virtual, there would be essentially no material or cost requirements for future use. Virtual educational materials were delivered via text message or email for participants to review at their leisure and save for further reference if desired. There was a considerable time commitment for the development of materials that were distributed in this project, which will now be available to other institutions for use. The time constraint for participants was minimal—each survey took two to three minutes to complete.

Our project has a few limitations. First, the sample size was small, as this was a pilot project, and clinician recruitment began in 2020 during the coronavirus pandemic. The timing of this led to recruitment challenges as there were increased work hours and demands for clinicians during this time. This limitation likely influenced the ability to detect differences between subgroups and for other specific score domains (i.e., diagnosis, referral, gentle skin care). Additionally, though the project was offered to residents and advanced practice providers, most of the participants were attending physicians, thus limiting generalizability to a more diverse group of clinicians.

Conclusion

Emergency department visits for pediatric AD are increasing and clinicians should be comfortable and confident managing AD. This QI initiative was successful in educating clinicians on diagnosing and managing this condition while providing them with a library of point-of-care resources to be used in clinical settings. We hope that our intervention serves as a structured and replicable way to improve care for children with AD across the country.

Potential conflicts of interest

The authors declare no conflicts of interest.

References

1. Silverberg JI, Barbarot S, Gadkari A, et al. Atopic dermatitis in the pediatric population: A cross-sectional, international epidemiologic study. *Ann Allergy Asthma Immunol* 2021;126:417-428.e2. [PMID: 33421555].
2. Silverberg JI. Public health burden and epidemiology of atopic dermatitis. *Dermatol Clin*. 2017;35:283-289. [PMID: 28577797].
3. Longowal M, Woo TE, D'Mello J, Ramien M. The treatment and management of atopic dermatitis in the pediatric emergency department: highlighting physician practices and the desire for patient-centered resources. *Pediatr Dermatol*. 2021;38:1372-1373. [PMID: 34390032].
4. Moon AT, Castelo-Soccio L, Yan AC. Emergency department utilization of pediatric dermatology (PD) consultations. *J Am Acad Dermatol*. 2016;74:1173-1177. [PMID: 26896295].
5. AlKhater SA, Dibo R, Al-Awam B. Prevalence and pattern of dermatological disorders in the pediatric emergency service. *J Dermatol Dermatol Surg*. 2017;21:7-13. [DOI: 10.1016/j.jdds.2016.05.003].
6. Al-Naqeeb J, Danner S, Fagnan LJ, et al. The burden of childhood atopic dermatitis in the primary care setting: a report from the Meta-LARC Consortium. *J Am Board Fam Med*. 2019;32:191-200. [PMID: 30850455].
7. Prindaville B, Horii KA, Siegfried EC, Brandling-Bennett H. Pediatric dermatology workforce in the United States. *Pediatr Dermatol*. 2019;36:166-168. [PMID: 30318628].
8. Young TK, Glick AF, Yin HS, et al. Management of pediatric atopic dermatitis by primary care providers: a systematic review. *Acad Pediatr*. 2021;21:1318-1327. [PMID: 34280477].
9. Fishbein AB, Hamideh N, Lor J, et al. Management of atopic dermatitis in children younger than two years of age by community pediatricians: a survey and chart review. *J Pediatr*. 2020;221:138-144.e3. [PMID: 32171558].
10. Sehgal I, Paladichuk H, Shivaprakash N, et al. (eds). Atopic Dermatitis Guideline, Dell Children's Evidence Based Outcomes Center. 2021. https://www.dellchildrens.net/wp-content/uploads/sites/60/2021/08/Atopic-Dermatitis-Guideline.pdf. Accessed on February 5, 2022.
11. MedData Group. Physician Virtual Communications Survey. https://www.meddatagroup.com/wp-content/uploads/ON24.pdf. Accessed on February 5, 2022.

Table 1. *Clinician quiz scores.*

	N	Change in raw score post-intervention versus pre-intervention (%) All questions	P	Change in raw score post-intervention versus pre-intervention (%) Treatment questions only	P
All participants	56	10 (±4.97)	<0.001	36.91 (±8.60)	<0.001
Level of training			0.41		0.15
Resident or fellow physician	11	4.55 (±15.04)		45.46 (±18.21)	
Attending physician	42	11.91 (±5.23)		32.54 (±5.23)	
Nurse practitioner or physician assistant	3	3.33 (±17.28)		66.67 (±37.72)	
Dermatology elective experience			0.8		0.87
Yes	31	10.32 (±6.13)		35.48 (±11.71)	
No	25	9.6 (±8.28)		38.67 (±12.89)	
Primary practice location			0.11		0.72
Outpatient	34	13.53 (±5.48)		38.24 (±11.08)	
Hospital or urgent care	22	4.55 (±9.09)		34.85 (±13.91)	
Years in practice			0.09		0.3
<5	20	4.01 (±9.48)		35.00 (±15.34)	
5-10	6	6.66 (±12.05)		50.01 (±32.67)	
10-15	10	14.00 (± 12.46)		23.34 (±19.60)	
15-20	10	14.00 (±10.20)		36.67 (±18.09)	
20+	10	16.00 (±9.78)		46.67 (±17.42)	

Table 2. *Clinician confidence scores (N=56).*

Atopic dermatitis domain (number of questions)	Pre-intervention average Likert scores	Post-intervention average Likert scores	Score difference	Percent of participants with improved Likert scores post-intervention	P*
Overall (8)	3.73	4.08	0.35	66%	<0.001
Diagnosis (3)	3.88	4.19	0.31	54%	<0.001
Treatment (3)	3.49	3.95	0.46	61%	<0.001
Gentle skin care (1)	4.25	4.46	0.21	32%	0.043
Referrals (1)	3.46	4.13	0.67	39%	0.065

*The Sign Rank test was used.

Table 3. *Participant feedback and acceptability.*

Category	Example comments
Survey delivery and technology	"The text reminders to complete quizzes, and the availability to complete quizzes on my phone was also a nice touch." "One of the aspects that made this project so successful was the communication by texting. Things tend to easily get lost in my email in basket, but the texts are a nice way to stay accountable." "I emailed the coordinator…with specific questions like the minimum age to start topical steroids…I received prompt and detailed replies answering my questions which was really helpful."
Clinician impact	"I was able to change the way I practice steroids for eczema. I specifically stopped using OTC hydrocortisone and started using moderate to high potency steroids for more difficult to manage cases." "I am taking a much more evidence-based approach in diagnosis and treatment and ultimately my patients have had better outcomes."
Clinician educational materials	"The atopic dermatitis pathway serves as an outstanding framework for approaching all atopic dermatitis, and I especially appreciated the time frames with which specific cases should be seen by dermatology as well as the refresher on the different formulations/uses of various topical steroid preparations." "I frequently refer to the materials from the project while working with the pediatric trainees that I supervise every day in their outpatient continuity clinic."
Patient educational materials	"My patients appreciated the implementation of the discharge instructions and patient information as the recommendations are extensive and can be difficult to remember in their entirety." "…the videos created for Spanish speaking patients have already improved my practice and many children's skin. A next step that could be wonderful is to dub over the video in many languages. My clinic could use French, Pashto, Burmese, Arabic…" "I have already modified my smart phrases in our EHR about AD instructions including new information and patient instructions acquired through the study. I have also contacted our EHR committee asking them to incorporate the QR code and links to the patient handouts and videos in the EHR smart sets and patient information section."

Appendix A. *Entry Survey, Quizzes 1-3, and Exit Survey. For clinicians.*

Page 1

Entry Survey

Please complete the survey below.

Thank you!

Please complete the following demographic questions. This should take less than 3 minutes.

By proceeding with this survey, you are consenting to participate in this QI project which will involve 3 Quizzes, a pre & post-intervention survey and online educational tools. Your email will be retained, but will be kept confidential and separate from your performance on the quizzes. Results will be used in a deidentified fashion to help us create appropriate educational interventions and assess the efficacy of this program.

- ◯ No, I do not consent.
- ◯ Yes, I consent.

Please enter your email.

_____

Are you okay with receiving infrequent text messages with links to online educational videos and tools, as well as quizzes that need to be completed?

- ◯ Yes
- ◯ No

Please enter your phone number.

_____

For pediatricians, participation in this project is eligible for 25 points of MOC Part 4 Credit through the American Board of Pediatrics. Residents can earn early MOC credit.

Would you like to apply for this?

- ◯ Yes
- ◯ No
- ◯ Does not apply to me

Thanks for your interest. Please enter an accurate email, and we will contact you with next steps for MOC credit.

If you would like further information on this project you can find it at at the ABP website: https://cont-certification.abp.org/moc/moc-dashboard/moc-activities/quality-improvement/atst-form-activities/activity-details/16515. The project title is: "Improving Emergency Department and Community Management of Atopic Dermatitis."

_____

What is your current level of training?

- ◯ PEM Fellow
- ◯ PEM Attending
- ◯ EM resident
- ◯ EM attending
- ◯ Physician assistant or nurse practitioner
- ◯ Pediatrician
- ◯ Pediatric resident
- ◯ Family medicine resident
- ◯ Family medicine attending
- ◯ Other

Please type your job title/description.

_____

What is your primary practice location?

- ◯ Children's hospital
- ◯ Community hospital
- ◯ Urgent care clinic
- ◯ Outpatient Clinic
- ◯ Other

Please describe your primary practice location.

_____

How many years of clinical experience do you have past residency (or past graduation from PA or NP school if applicable)?

- ◯ < 5 years
- ◯ 5-10 years
- ◯ 10-15 years
- ◯ 15-20 years
- ◯ 20+ years

Please select your current year in training.

- ◯ PGY-1
- ◯ PGY-2
- ◯ PGY-3
- ◯ PGY-4
- ◯ PGY-5
- ◯ PGY-6
- ◯ Pedi Chief Resident

Have you taken any dermatology electives during your medical training?

- ◯ Yes
- ◯ No

Which dermatology elective(s) have you taken? (Please select all that apply).

- ☐ Pediatric dermatology
- ☐ General dermatology
- ☐ Other

Approximately what percentage of the patients you see in an average day are < 18 years old?

- ○ < 25%
- ○ 25-50%
- ○ 50-75%
- ○ 75-100%

For the following, please choose how much you agree or disagree with the statements.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I can accurately diagnose atopic dermatitis in children.	○	○	○	○	○
I can accurately diagnose bacterial superinfection superimposed on atopic dermatitis in children.	○	○	○	○	○
I can accurately diagnose eczema herpeticum in children.	○	○	○	○	○
I can prescribe the appropriate topical steroid according to severity of atopic dermatitis.	○	○	○	○	○
I can prescribe the appropriate treatment for bacterial superinfection superimposed on atopic dermatitis.	○	○	○	○	○
I can prescribe the appropriate treatment for eczema herpeticum.	○	○	○	○	○

I understand when a patient with atopic dermatitis should follow-up with primary care provider vs pediatric dermatology.	○	○	○	○	○
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I can counsel a patient with atopic dermatitis on gentle skin care practices (i.e. choosing moisturizer, bathing, avoidance of triggers, etc).	○	○	○	○	○

Current instrument: **Atopic Dermatitis Quiz 1** Preview instrument

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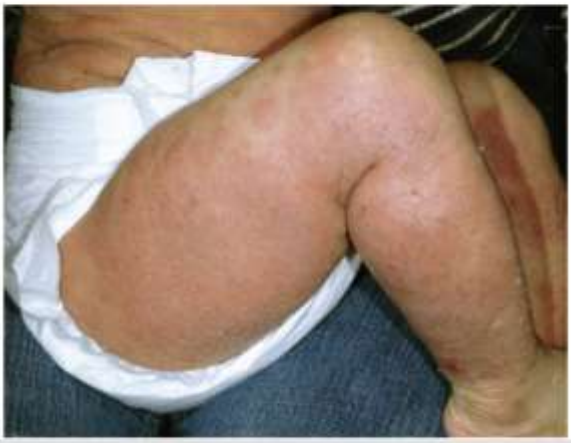

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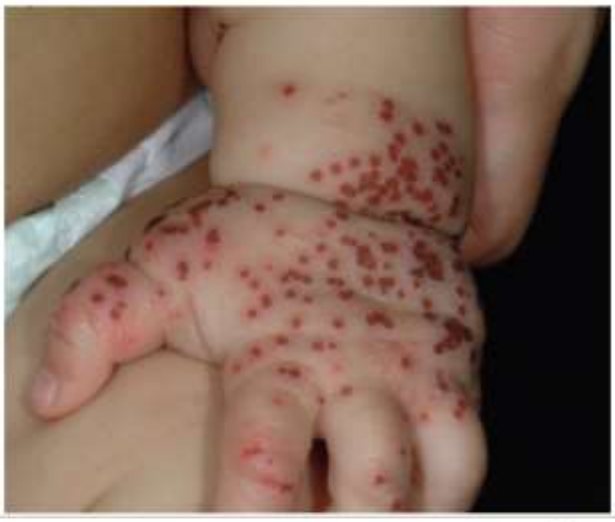
Variable: dx_severead

How would you classify the skin findings in this patient?

* must provide value

- ○ Mild atopic dermatitis
- ○ Moderate atopic dermatitis
- ○ Severe atopic dermatitis
- ○ Moderate atopic dermatitis with bacterial superinfection



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Variable: dx_eh

How would you classify the skin findings in this patient?

* must provide value

- ○ Mild atopic dermatitis
- ○ Moderate atopic dermatitis with bacterial superinfection
- ○ Eczema herpeticum
- ○ None of the above

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Variable: dx_nopic_ad

What are the most common locations to find skin changes in a child with infantile (0-6 months old) atopic dermatitis?

* must provide value

- ○ Flexural areas such as popliteal fossae, antecubital fossae, etc
- ○ Extensor extremities, torso, face, scalp
- ○ Groin and diaper area
- ○ All of the above

DermNet New Zealand (https://dermnetnz.org/images)

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Variable: tx_mildad

Please select the most appropriate initial treatment regimen for this patient.

* must provide value

- Desonide 0.05% ointment BID x 2 weeks
- Hydrocortisone 1% ointment BID x 2 weeks
- Hydrocortisone 2.5% cream BID x 2 weeks
- Clobetasol 0.05% cream BID x 2 weeks

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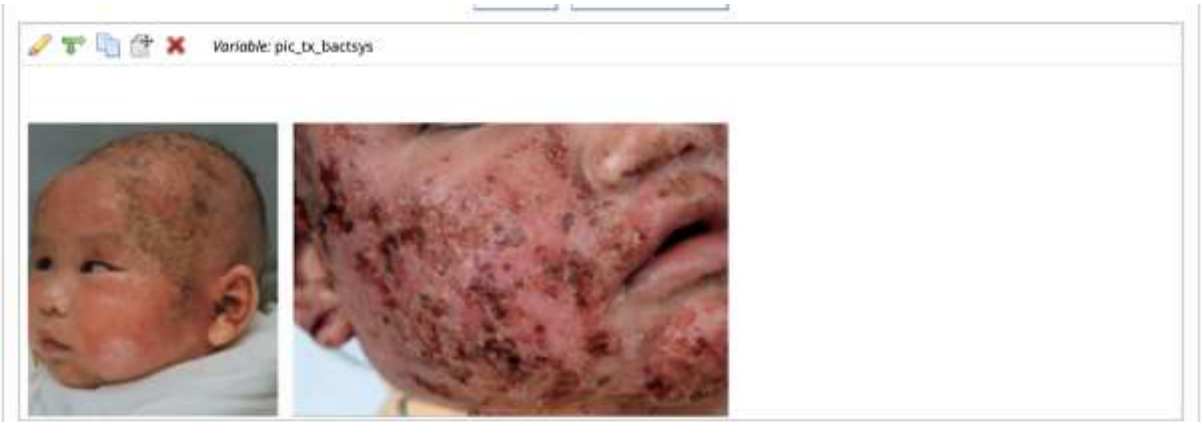

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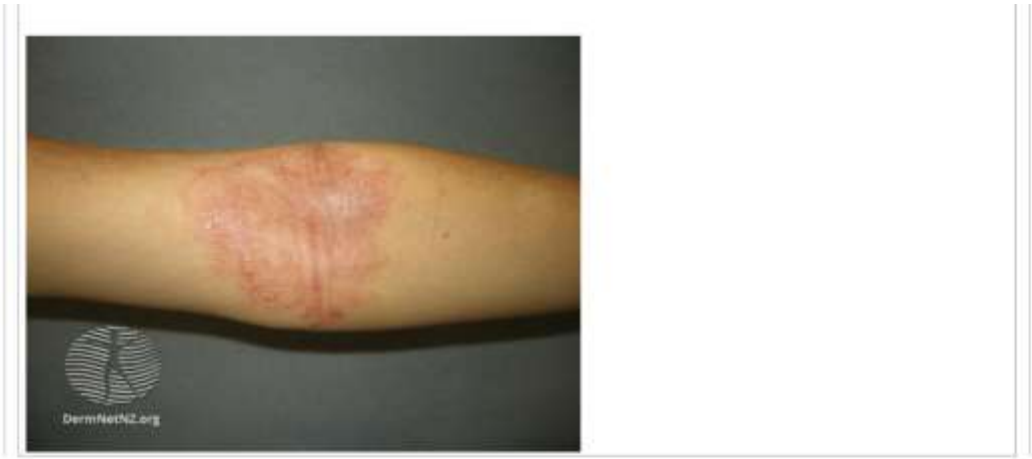
Variable: tx_bactsys

Select the most appropriate initial management strategy for this patient.

* must provide value

- Fungal culture, topical nystatin, and cephalexin x 10 days
- Bacterial culture, HSV PCR, hydrocortisone 1% ointment BID x 2 weeks, empiric acyclovir and cephalexin x 10 days
- Bacterial culture, desonide 0.05% ointment BID x 2 weeks, empiric cephalexin x 10 days
- HSV PCR, empiric acyclovir, mupirocin 2% ointment TID x 10 days, desonide 0.05% ointment BID x 2 weeks



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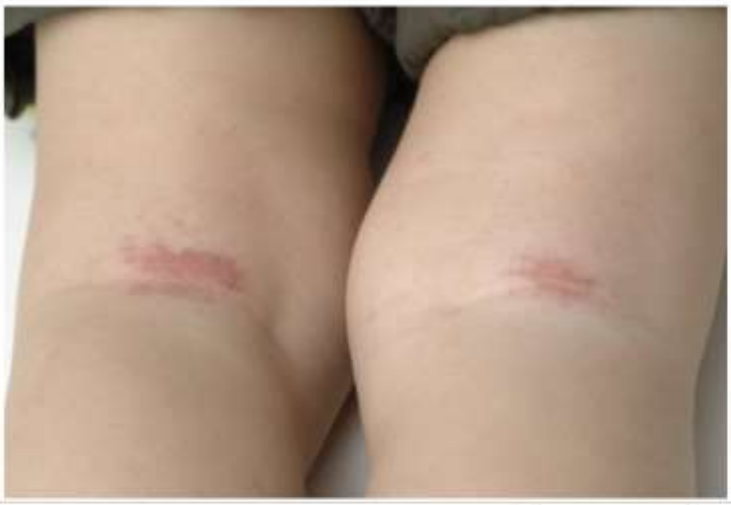
Variable: tx_severead

Patient complains that rash is worse despite BID use of triamcinolone 0.1% cream x 3 weeks. You decide to change her treatment. What is the best choice?

* must provide value

- ○ Triamcinolone 0.1% ointment BID x 2 weeks, add antihistamines for pruritus
- ○ Mometasone 0.1% ointment BID x 2 weeks
- ○ Mupirocin 2% ointment TID x 10 days and triamcinolone 0.1% ointment BID x 2 weeks
- ○ Clobetasol 0.1% cream BID x 2 weeks



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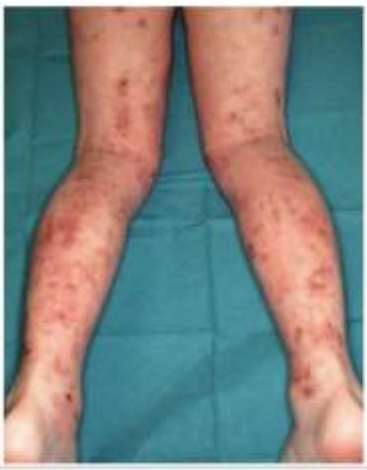
Variable: refpcp_mildad

Patient states desonide 0.05% ointment prescribed by PCP helps but does not clear plaques; they still have significant pruritus. What is the next best step?

* must provide value

- ○ Continue desonide 0.05% ointment BID, refer to pedi derm
- ○ Request derm consult for recs prior to discharge, follow up with PCP
- ○ Start triamcinolone 0.1% ointment BID x 2 weeks, follow up with PCP
- ○ Start triamcinolone 0.1% ointment BID x 2 weeks, refer to pedi derm



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/21/22, 7:56 PM Educating the Pediatric Emergency Medicine Provider on the Diagnosis and Management of Atopic Dermatitis and Superinfec

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Variable: refderm_severead

This patient reports rash is no better despite using hydrocortisone 2.5% ointment BID for 1 month. What is the next best step?

* must provide value

- ○ Continue hydrocortisone 2.5% ointment, dispense 454 g, refer to pedi derm
- ○ Start clobetasol 0.05% ointment BID, dispense 30 g, refer to pedi derm
- ○ Start triamcinolone 0.1% ointment BID, dispense 454 g, refer to pedi derm
- ○ Start Medrol dose pack, continue hydrocortisone 2.5% ointment BID, dispense 30 g, refer to pedi derm

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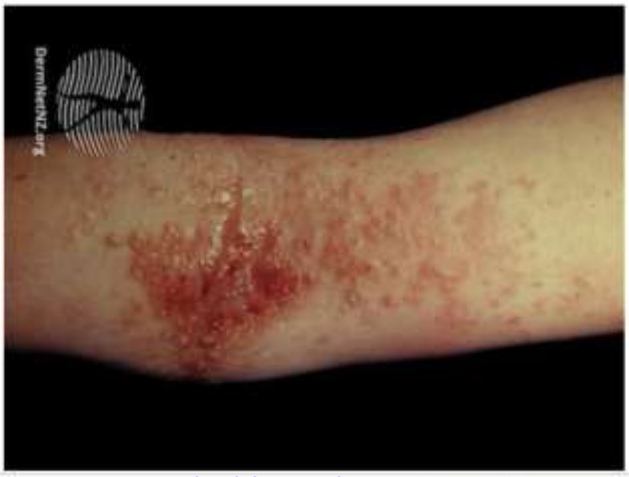

DermNet New Zealand (https://dermnetnz.org/images)

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Variable: refderm_bact

This patient presents to ED for a rash. He has been to the ED 3 times recently for similar issues; at the last visit the rash was cultured, and patient started on a 10 day course of cephalexin and desonide 0.05% ointment. Culture is now growing MRSA. What is next best step?

* must provide value

- ○ Repeat culture, stop cephalexin, start clindamycin (if sensitive), follow-up with PCP
- ○ Repeat culture, continue treatments, add mupirocin 2% ointment TID, refer to derm for expedited appt
- ○ Stop cephalexin, start clindamycin (if sensitive), refer to derm for routine appt, follow-up with PCP
- ○ Stop cephalexin, start clindamycin (if sensitive), follow-up with PCP

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Variable: skincare

Which of the following is NOT recommend as part of gentle skin care for atopic dermatitis?

* must provide value

- ○ Frequent (3-5 times daily) use of emollients or thick creams
- ○ Complete drying of the skin after bathing prior to emollient use
- ○ Use of mittens or hand protection during sleep to minimize scratching
- ○ Trial of sedating antihistamines at bedtime for pruritus that interferes with sleep
- ○ None of the above--these are all recommended as gentle skin care for AD

The following are the questions you answered ***INCORRECTLY.*** The correct answers are highlighted.

If there are no questions shown below, you answered them all correctly!

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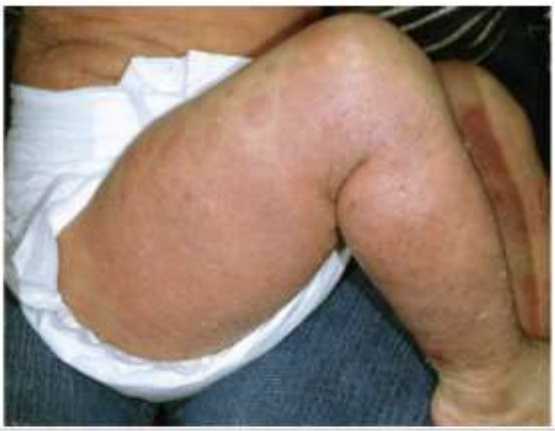
Variable: pic_dx_severead_2 *Branching logic:* [dx_severead] = '3' or [dx_severead] = '2' or [dx_severead] = '4'



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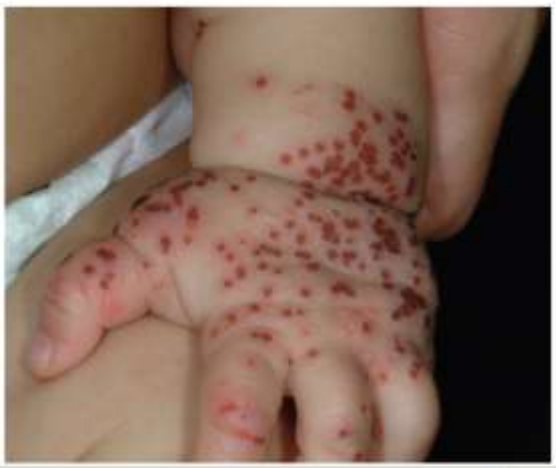
Variable: dx_severead_2 *Branching logic:* [dx_severead] = '3' or [dx_severead] = '2' or [dx_severead] = '4'

How would you classify the skin findings in this patient?

Mild atopic dermatitis
Moderate atopic dermatitis
Severe atopic dermatitis
Moderate atopic dermatitis with bacterial superinfection

**This presentation is severe (confluent, thick, eroded eczematous plaques covering the majority of the body).*



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Variable: dx_eh_2 Branching logic: [dx_eh] = '3' or [dx_eh] = '2' or [dx_eh] = '4'

How would you classify the skin findings in this patient?

Mild atopic dermatitis
Moderate atopic dermatitis with bacterial superinfection
Eczema herpeticum
None of the above

**Eczema herpeticum presents as vesicles or punched-out erosions on background atopic dermatitis.*

Variable: dx_nopic_ad_2 Branching logic: [dx_nopic_ad] = '2' or [dx_nopic_ad] = '3' or [dx_nopic_ad] = '4'

What are the most common locations to find skin changes in a child with infantile (0-6 months old) atopic dermatitis?

Flexural areas such as popliteal fossae, antecubital fossae, etc
Extensor extremities, torso, face, scalp
Groin and diaper area
All of the above

**Infantile AD usually involves the above areas whereas childhood and adult AD tends to involve flexural surfaces. AD is unlikely in the groin/diaper area as this is a moist environment.*

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Variable: pic_tx_mildad_2 Branching logic: [tx_mildad] = '2' or [tx_mildad] = '3' or [tx_mildad] = '4'

DermNet New Zealand (https://dermnetnz.org/images)

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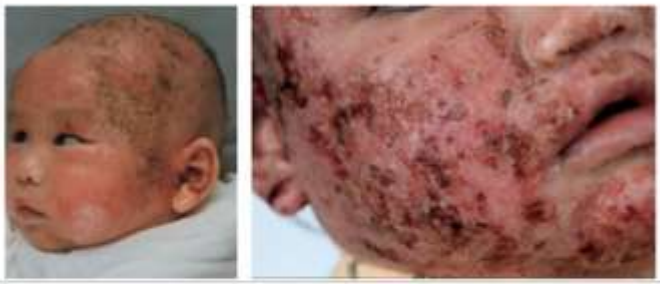
Variable: tx_mildad_2 Branching logic: [tx_mildad] = '2' or [tx_mildad] = '3' or [tx_mildad] = '4'

Please select the most appropriate initial treatment regimen for this patient.

Desonide 0.05% ointment BID x 2 weeks *(low potency)*
Hydrocortisone 1% ointment BID x 2 weeks *(very low potency/over the counter)*
Hydrocortisone 2.5% cream BID x 2 weeks *(low potency)*
Clobetasol 0.05% cream BID x 2 weeks *(very high potency)*

**This is mild AD, thus a low potency topical steroid such as desonide or hydrocortisone 2.5% would be the best treamtent; ointments are superior to creams.*



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3/21/22, 7:56 PM Educating the Pediatric Emergency Medicine Provider on the Diagnosis and Management of Atopic Dermatitis and Superinfect

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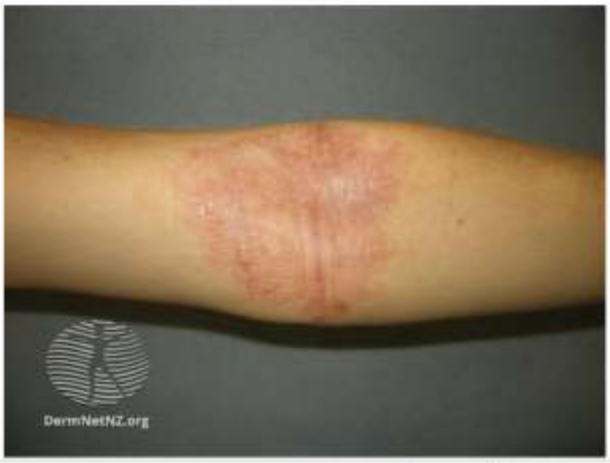
Variable: tx_bactsys_2 (branching logic: [tx_bactsys] = '2' or [tx_bactsys] = '3' or [tx_bactsys] = '4'

Select the most appropriate initial management strategy for this patient.

Fungal culture, topical nystatin, and cephalexin x 10 days
Bacterial culture, HSV PCR, hydrocortisone 1% ointment BID x 2 weeks, empiric acyclovir and cephalexin x 10 days
Bacterial culture, desonide 0.05% ointment BID x 2 weeks, empiric cephalexin x 10 days
HSV PCR, empiric acyclovir, mupirocin 2% ointment TID x 10 days, desonide 0.05% ointment BID x 2 weeks

**Eroded eczematous plaques with prominent honey-crust are typical of AD with bacterial superinfection (aka impetiginized AD). Management should include bacterial culture, empiric antibiotics, and a low potency topical steroid (given the location on the face).*



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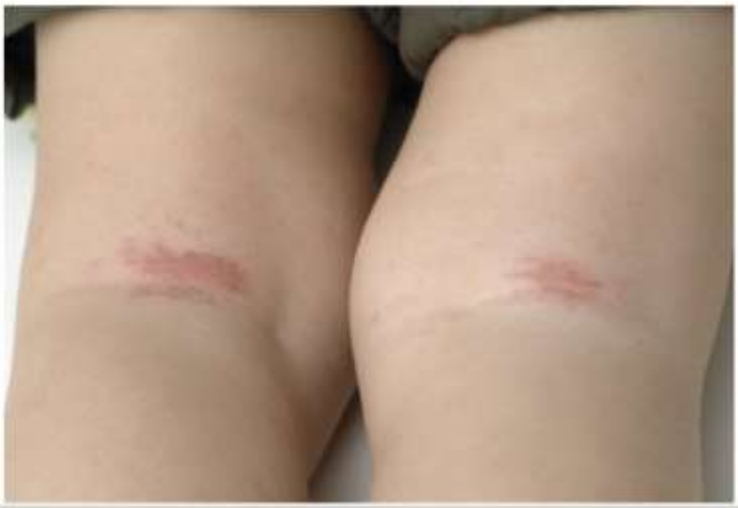
Variable: tx_severead_2 *Branching logic:* [tx_severead] = '2' or [tx_severead] = '3' or [tx_severead] = '4'

Patient complains that rash is worse despite BID use of triamcinolone 0.1% cream x 3 weeks. You decide to change her treatment. What is the best choice?

Triamcinolone 0.1% ointment BID x 2 weeks, add antihistamines for pruritus *(medium potency)*
Mometasone 0.1% ointment BID x 2 weeks *(high potency)*
Mupirocin 2% ointment TID x 10 days and triamcinolone 0.1% ointment BID x 2 weeks *(medium potency)*
Clobetasol 0.1% cream BID x 2 weeks *(very high potency)*

**This large, lichenified eczematous plaque which is not improving with weeks of medium-potency topical steroid should be treated with a high potency steroid such as mometasone or clobetasol; ointments are superior to creams.*



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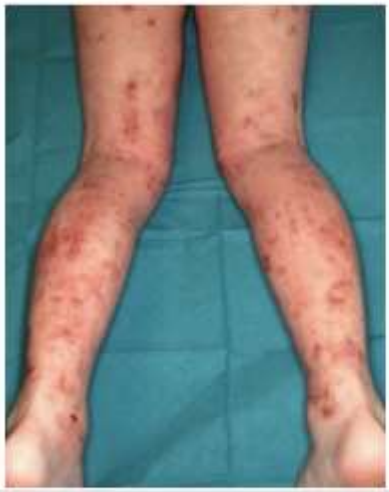
Variable: refpcp_mildad_2 *Branching logic:* [refpcp_mildad] = '2' or [refpcp_mildad] = '3' or [refpcp_milda...

Patient states desonide 0.05% ointment prescribed by PCP helps but does not clear plaques; they still have significant pruritus. What is the next best step?

Continue desonide 0.05% ointment BID, refer to pedi derm *(low potency)*
Request derm consult for recs prior to discharge, follow up with PCP
Start triamcinolone 0.1% ointment BID x 2 weeks, follow up with PCP *(medium potency)*
Start triamcinolone 0.1% ointment BID x 2 weeks, refer to pedi derm

**This is mild AD with inadequate improvement on low potency topical steroids, thus a medium potency steroid should be prescribed. Mild-moderate AD should generally follow-up with PCP unless already seeing pedi derm.*



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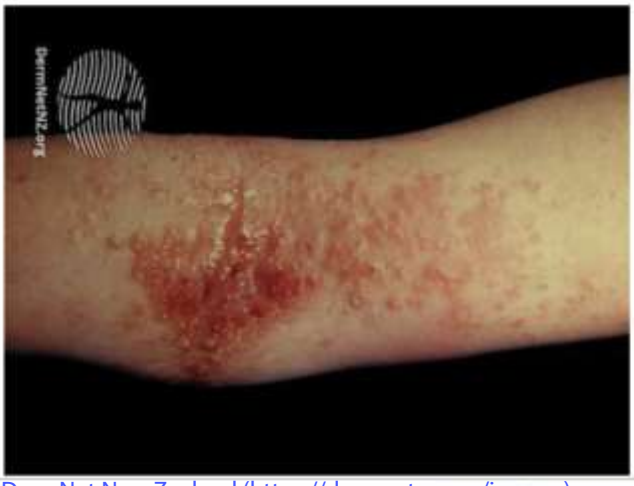
Variable: refderm_severead_2 Branching logic: [refderm_severead] = '2' or [refderm_severead] = '3' or [refder...

This patient reports rash is no better despite using hydrocortisone 2.5% ointment BID for 1 month. What is the next best step?

Continue hydrocortisone 2.5% ointment, dispense 454 g, refer to pedi derm *(low potency)*
Start clobetasol 0.05% ointment BID, dispense 30 g, refer to pedi derm *(very high potency)*
Start triamcinolone 0.1% ointment BID, dispense 454 g, refer to pedi derm *(medium potency)*
Start Medrol dose pack, continue hydrocortisone 2.5% ointment BID, dispense 30 g, refer to pedi derm

**This is severe AD that warrants a non-urgent referral to derm. Although clobetasol ointment would be an appropriate treatment, this patient requires much more than 30 g to treat the BSA involved. In these cases, the medium potency triamcinolone 0.1% ointment is often a good choice as it comes in a 454 g jar and the patient can use it aggressively.*



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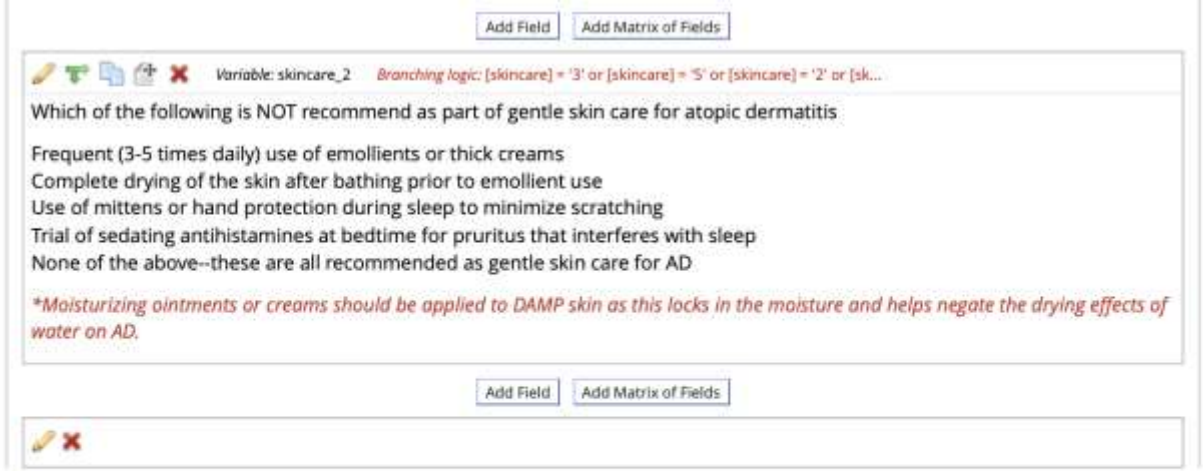
Variable: refderm_bact_2 *Branching logic:* [refderm_bact] = '2' or [refderm_bact] = '3' or [refderm_bact] ...

This patient returns to ED for worsening rash. He has been to the ED 3 times recently for similar issues; at the last visit the rash was cultured, and patient started on a 10 day course of cephalexin and desonide 0.05% ointment. Culture is now growing MRSA. What is next best step?

Repeat culture, stop cephalexin, start clindamycin (if sensitive), follow-up with PCP
Repeat culture, continue treatments, add mupirocin 2% ointment TID, refer to derm for expedited appt
Stop cephalexin, start clindamycin (if sensitive), refer to derm for routine appt, follow-up with PCP
Stop cephalexin, start clindamycin (if sensitive), follow-up with PCP

**This is a severe case of AD with bacterial superinfection now growing MRSA thus the patient's therapy should be altered to cover MRSA. The culture does not need to be repeated. Given the severity of this infection and the history of repeated AD superinfections, they warrant a non-urgent referral to pedi derm; they should still follow-up from ED with PCP.*



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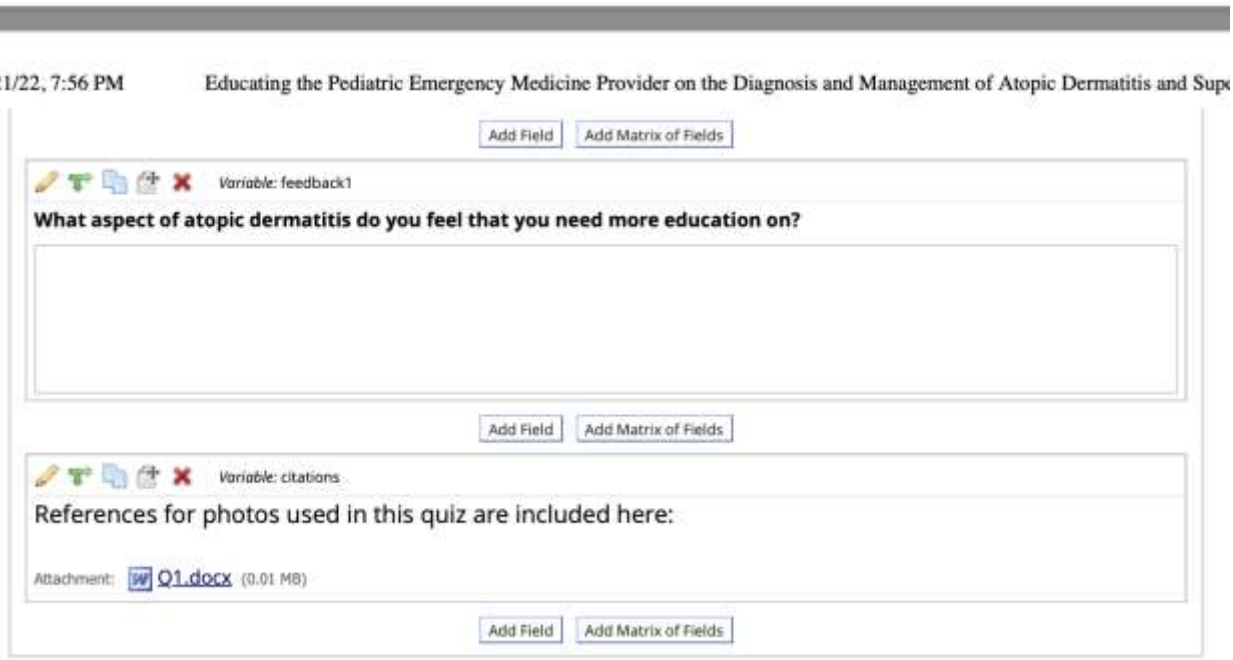

Citations

Picture 1: Figure 3-5. In: Hurwitz S, Paller AS, Mancini AJ. Hurwitz Clinical Pediatric Dermatology a Textbook of Skin Disorders of Childhood and Adolescence [electronic textbook]. Edinburgh: Elsevier; 2016.

Picture 2: Figure 3-29. In: Hurwitz S, Paller AS, Mancini AJ. Hurwitz Clinical Pediatric Dermatology a Textbook of Skin Disorders of Childhood and Adolescence [electronic textbook]. Edinburgh: Elsevier; 2016.

Picture 3: Photo courtesy of DermNet NZ. https://creativecommons.org/licenses/by-nc-nd/3.0/nz/legalcode. No changes made.

Picture 4: Eczema Management. The Royal Children's Hospital Melbourne. https://www.rch.org.au/rchcpg/hospital_clinical_guideline_index/Eczema_management/. Accessed January 9, 2020.

Picture 5: Photo courtesy of DermNet NZ. https://creativecommons.org/licenses/by-nc-nd/3.0/nz/legalcode. No changes made.

Picture 6: Eczema Pictures: What an Eczema Rash Looks Like. WebMD. https://www.webmd.com/skin-problems-and-treatments/eczema/ss/slideshow-eczema-overview. Accessed January 9, 2020

Picture 7: McAleer M A, Flohr C, Irvine A D. Management of difficult and severe eczema in childhood BMJ 2012; 345 :e4770

Picture 8: Photo courtesy of DermNet NZ. https://creativecommons.org/licenses/by-nc-nd/3.0/nz/legalcode. No changes made.

Current instrument: **Atopic Dermatitis Quiz 2** Preview instrument

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Matrix group: likerthelpful

Please rate any of the following educational resources or tools you have used since the last quiz:

	Not at all helpful	Slightly helpful	Moderately helpful	Very helpful	Extremely helpful	Did not use
Variable: eboc **DCMC EBOC Atopic Dermatitis Guideline & supporting documents**	○	○	○	○	○	○
Variable: lect **Quick tips/reminders from Quiz 1 (included in email)**	○	○	○	○	○	○
Variable: other **Other resources not included in this project**	○	○	○	○	○	○

DermNet New Zealand (https://dermnetnz.org/images)

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Variable: dx_ehbact

How would you classify the skin findings in this patient?

* must provide value

- ○ Eczema herpeticum
- ○ Moderate atopic dermatitis with bacterial superinfection
- ○ Severe atopic dermatitis
- ○ Eczema herpeticum with coexistent bacterial superinfection

DermNet New Zealand (https://dermnetnz.org/images)

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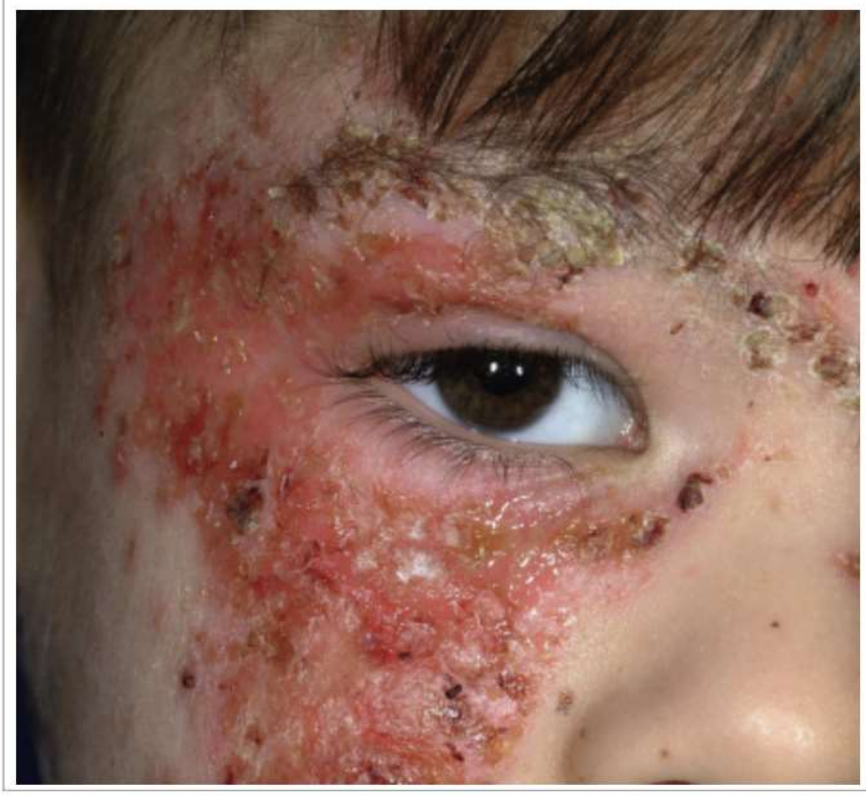
Variable: dx_mildad

How would you classify the skin findings in this patient?

* must provide value

- ○ Mild atopic dermatitis
- ○ Moderate atopic dermatitis
- ○ Mild atopic dermatitis with bacterial superinfection
- ○ Severe atopic dermatitis



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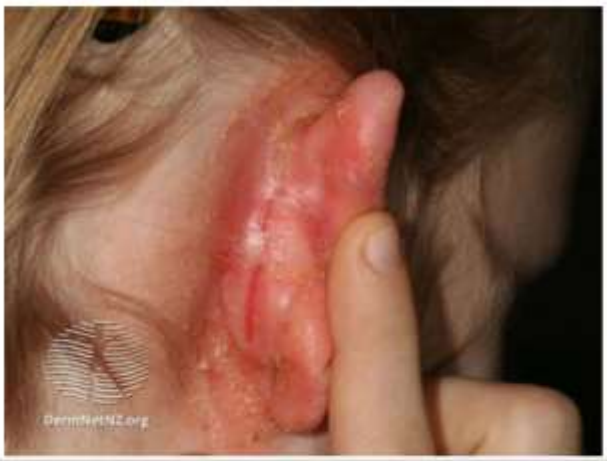
Variable: dx_modadbact

How would you classify the skin findings in this patient?

* must provide value

- ○ Eczema herpeticum
- ○ Moderate atopic dermatitis with bacterial superinfection
- ○ Severe atopic dermatitis
- ○ None of the above



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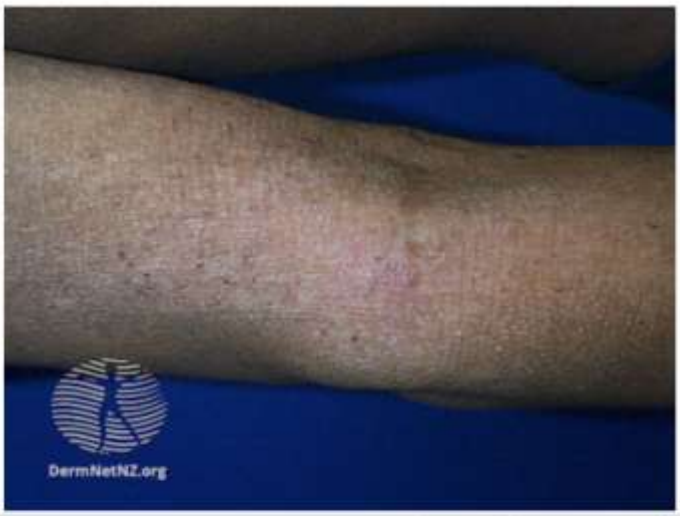
Variable: tx_bactloc

This otherwise healthy, well-appearing patient has been applying desonide 0.05% ointment BID for weeks however her rash is worsening. What is the next best step (in addition to bacterial culture)?

* must provide value

- ○ Start po clindamycin x 10 days and desonide 0.05% ointment x 2 weeks
- ○ Start topical acyclovir x 10 days and triamcinolone 0.1% ointment BID x 2 weeks
- ○ Start cephalexin x 10 days and mometasone 0.1% solution BID x 2 weeks
- ○ Start mupirocin 2% ointment TID x 10 days and triamcinolone 0.1% ointment BID x 2 weeks



DermNet New Zealand (https://dermnetnz.org/images)

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Variable: tx_modadquant

This patient has been using hydrocortisone 2.5% ointment for a month with minimal improvement. These skin findings are covering the majority of the body. What is the next best step?

* must provide value

- ○ Start desonide 0.05% ointment BID x 2 weeks, dispense 80 g supply
- ○ Start mometasone 0.1% ointment BID x 2 weeks, dispense 30 g supply
- ○ Start triamcinolone 0.1% ointment BID x 2 weeks, dispense 454 g supply
- ○ Start clobetasol 0.05% ointment BID x 1 week, dispense 30 g supply

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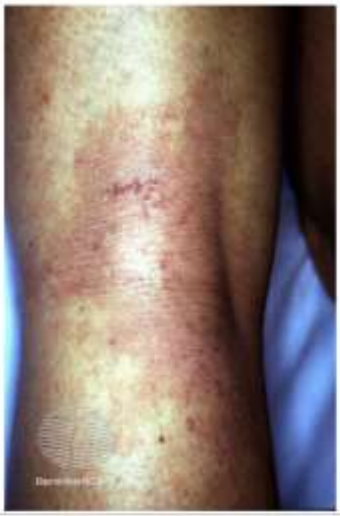
Variable: tx_itch_nopic

A child with atopic dermatitis cannot sleep due to nighttime itching. His skin is nearly clear on his current topical steroid. Please select the next best step.

* must provide value

- ○ Start stronger topical steroid, recommend wet wraps qhs to relieve itching
- ○ Start hydroxyzine 0.5mg/kg PO qhs
- ○ Start cetirizine 5 mg PO qhs
- ○ Recommend application of topical steroid immediately before child goes to bed to relieve night time itching



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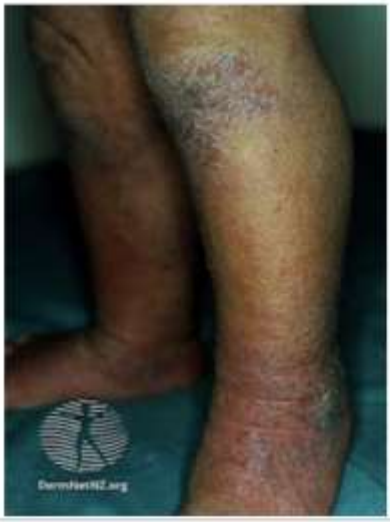
Variable: refderm_modad

This patient has been seen in the ED 3 times in the last 2 months for poorly-controlled, extensive atopic dermatitis despite consistent use of triamcinolone 0.1% ointment prescribed by the PCP. What is the next best step?

* must provide value

- ○ Admit patient for wet wraps and inpatient derm consultation.
- ○ Start mometasone 0.1% ointment BID x 2 weeks, refer to derm for expedited appt
- ○ Start clobetasol 0.05% ointment BID x 2 weeks, refer to derm for routine appt
- ○ Stop topical steroids, refer to derm for expedited appt



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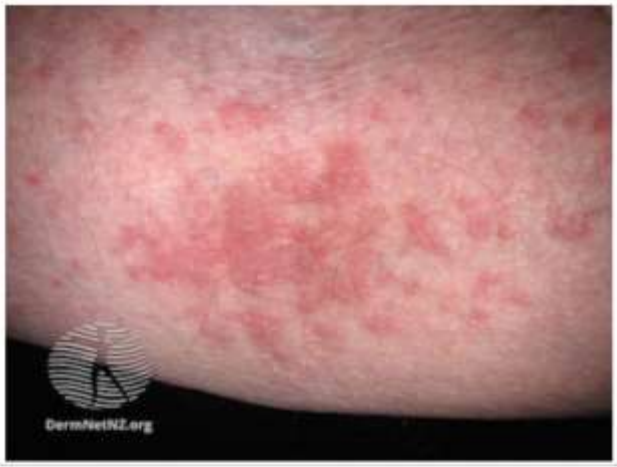
Variable: refderm_severead2

This patient with severe, refractory atopic dermatitis is being treated by pediatric dermatology with oral cyclosporine. They present to ED with fever and worsening rash. What is the next best step in addition to admission and fever work-up?

* must provide value

- ○ Continue cyclosporine, request routine derm follow-up at discharge
- ○ Continue cyclosporine, start triamcinolone 0.1% ointment & wet wraps, request expedited derm follow-up at discharge
- ○ Continue cyclosporine, request expedited derm follow-up at discharge
- ○ Consult dermatology regarding cyclosporine continuation vs discontinuation



DermNet New Zealand (https://dermnetnz.org/images)

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Variable: refpcp_modad

This patient presents to the ED stating they have used desonide 0.05% ointment BID for 2 months with minimal improvement. They have not followed up with PCP since desonide was prescribed. What is the next best step?

* must provide value

- ○ Admit for steroid augmentation, wet wraps, derm consultation.
- ○ Stop desonide, start triamcinolone 0.1% ointment BID x 2 weeks, follow up with PCP
- ○ Continue desonide 0.05% ointment, refer to derm for expedited appt
- ○ Stop steroids, encourage emollient use, refer to derm for expedited appt

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Variable: skincare2

Which of the following should be recommended for a patient with atopic dermatitis?

* must provide value

- ○ A. Lotion rather than cream as it has higher water content
- ○ B. Use of antibiotic soap when bathing to prevent superinfection
- ○ C. Topical products with plant-based fragrances only
- ○ A & B
- ○ None of the above

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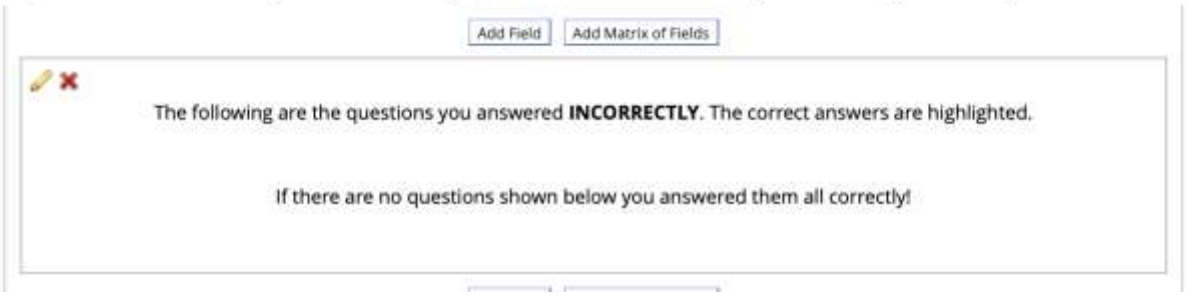

DermNet New Zealand (https://dermnetnz.org/images)

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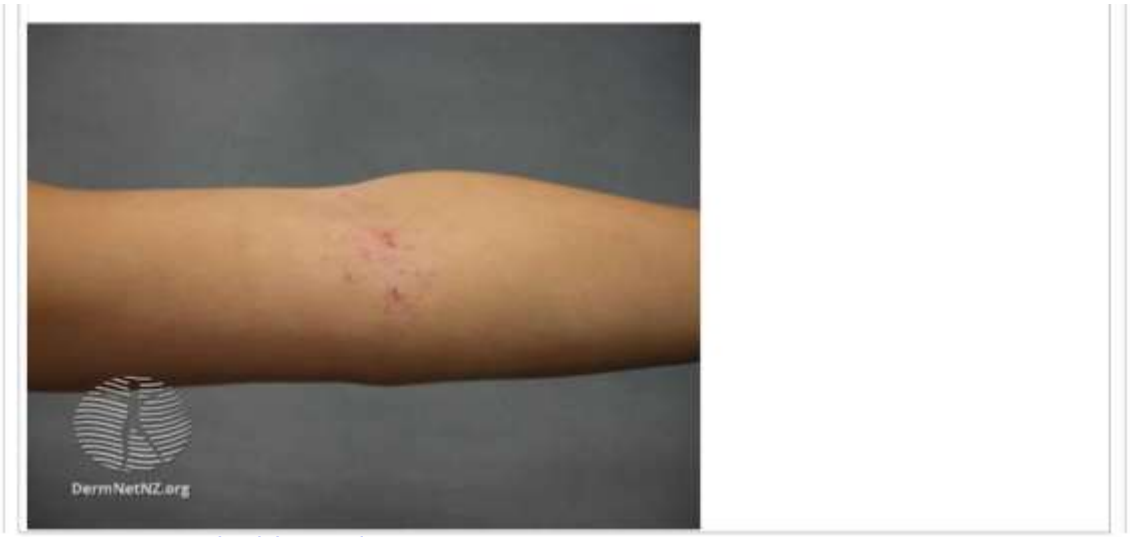
Variable: dx_ehbact_2 *Branching logic:* [dx_ehbact] = '2' or [dx_ehbact] = '3' or [dx_ehbact] = '4'

How would you classify the skin findings in this patient?

Eczema herpeticum
Moderate atopic dermatitis with bacterial superinfection
Severe atopic dermatitis
Eczema herpeticum with coexistent bacterial superinfection

**The clue to this diagnosis is the punched-out erosions with superimposed honey-crusting.*



DermNet New Zealand (https://dermnetnz.org/images)

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3/21/22, 7:58 PM Educating the Pediatric Emergency Medicine Provider on the Diagnosis and Management of Atopic Dermatitis and Superinfec

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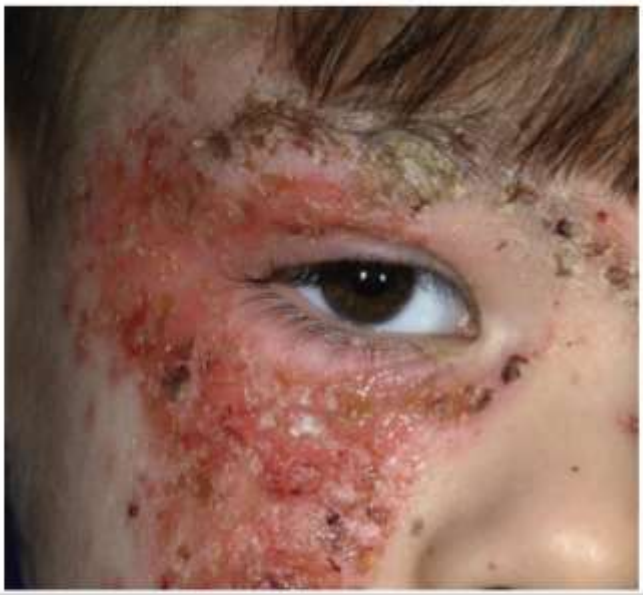
Variable: dx_mildad_2 Branching logic: [dx_mildad] = '2' or [dx_mildad] = '3' or [dx_mildad] = '4'

How would you classify the skin findings in this patient?

Mild atopic dermatitis
Moderate atopic dermatitis
Mild atopic dermatitis with bacterial superinfection
Severe atopic dermatitis

**Faint, thin pink papules coalescing into a small plaque suggests that this is mild AD. There are a few excoriations but no increased erythema or honey-crusting to suggeest bacterial infection.*



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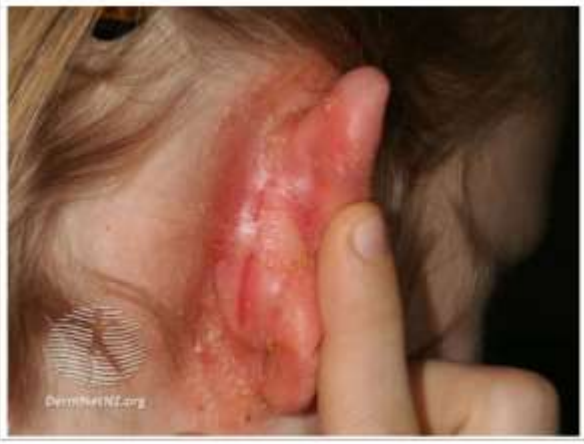
Variable: dx_modadbact_2 *Branching logic:* [dx_modadbact] = '2' or [dx_modadbact] = '3' or [dx_modadbact] ...

How would you classify the skin findings in this patient?

Eczema herpeticum
Moderate atopic dermatitis with bacterial superinfection
Severe atopic dermatitis
None of the above

**The intense erythema and erosions with honey-crusting are clues to this diagnosis.*



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https://redcap.ascension.org/txaus/redcap_v12.2.5/Design/online_designer.php?pid=6497&page=atopic_dermatitis_quiz_2

3/21/22, 7:58 PM Educating the Pediatric Emergency Medicine Provider on the Diagnosis and Management of Atopic Dermatitis and Sup

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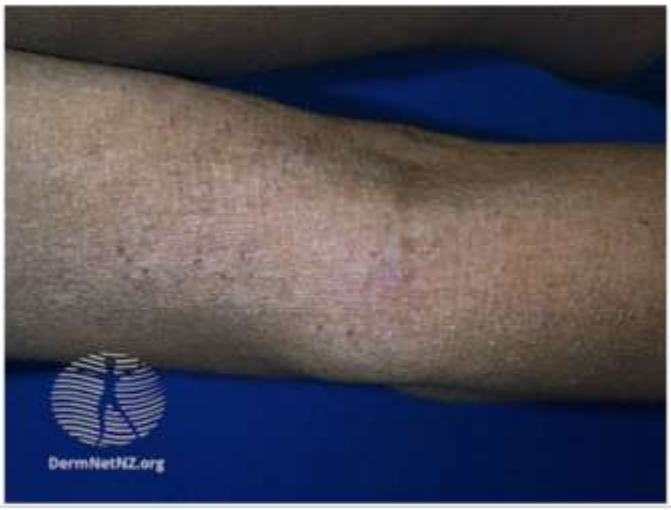
Variable: tx_bactloc_2 *Branching logic:* [tx_bactloc] = '2' or [tx_bactloc] = '3' or [tx_bactloc] = '4'

This otherwise healthy, well-appearing patient has been applying desonide 0.05% ointment BID for weeks however her rash is worsening. What is the next best step (in addition to bacterial culture)?

Start po clindamycin x 10 days and desonide 0.05% ointment x 2 weeks
Start topical acyclovir x 10 days and triamcinolone 0.1% ointment BID x 2 weeks
Start cephalexin x 10 days and mometasone 0.1% solution BID x 2 weeks
Start mupirocin 2% ointment TID x 10 days and triamcinolone 0.1% ointment BID x 2 weeks

There is **localized erythema and erosions with subtle honey-crusting in an **otherwise well-appearing** patient, thus topical antibiotics are sufficient. Increasing the strength of the steroid to a medium potency agent would be helpful to improve control of the AD. Mometasone is a high potency steroid which is not needed; in addition, a solution would burn the open sores.*



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Variable: tx_modadquant_2 Branching logic: [tx_modadquant] = '4' or [tx_modadquant] = '2' or [tx_modadquan...

This patient has been using hydrocortisone 2.5% ointment for a month with minimal improvement. These skin findings are covering the majority of the body. What is the next best step?

Start desonide 0.05% ointment BID x 2 weeks, dispense 80 g supply *(low potency)*
Start mometasone 0.1% ointment BID x 2 weeks, dispense 30 g supply *(high potency)*
Start triamcinolone 0.1% ointment BID x 2 weeks, dispense 454 g *supply* *(medium potency)*
Start clobetasol 0.05% ointment BID x 1 week, dispense 30 g supply *(very high potency)*

**The patient is failing a low potency topical steroid and has moderate-severe AD on exam, thus increasing strength to a medium or high potency steroid is indicated. Given the body surface area involved, this patient requires a large quantity to treat their AD. Triamcinolone and hydrocortisone are the only steroids that come in 454 g jars. An 80 gram tube would likely work however desonide is also a low potency steroid.*

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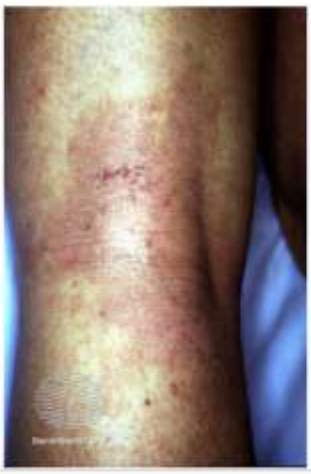
Variable: tx_itch_nopic_2 Branching logic: [tx_itch_nopic] = '2' or [tx_itch_nopic] = '3' or [tx_itch_nopic...

A child with atopic dermatitis cannot sleep due to nighttime itching. His skin is nearly clear on his current topical steroid. Please select the next best step.

Start stronger topical steroid, recommend wet wraps qhs to relieve itching
Start hydroxyzine 0.5mg/kg PO qhs
Start cetirizine 5 mg PO qhs
Recommend application of topical steroid immediately before child goes to bed to relieve night time itching

**First generation antihistamines such as hydroxyzine or diphenhydramine can help with nighttime pruritus, largely through its sedatory effects. Second generation antihistamines have not been shown to be helpful with AD pruritus unless there is an allergic component. The patient does not need a stronger topical steroid as their AD is nearly clear.*



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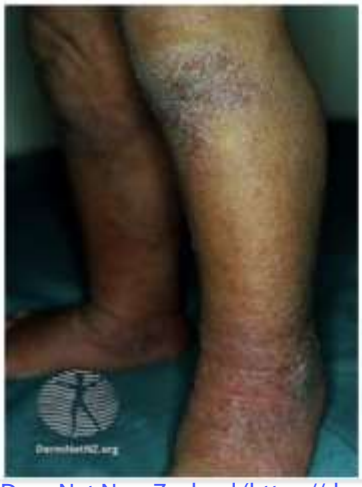
Variable: refderm_modad_2 Branching logic: [refderm_modad] = '2' or [refderm_modad] = '3' or [refderm_moda...

This patient has been seen in the ED 3 times in the last 2 months for poorly-controlled, extensive atopic dermatitis despite consistent use of triamcinolone 0.1% ointment prescribed by the PCP. What is the next best step?

Admit patient for wet wraps and inpatient derm consultation.
Start mometasone 0.1% ointment BID x 2 weeks, refer to derm for expedited appt *(high potency)*
Start clobetasol 0.05% ointment BID x 2 weeks, refer to derm for routine appt *(very high potency)*
Stop topical steroids, refer to derm for expedited appt

**Escalation of therapy to a high or very high potency steroid is appropriate however this patient warrants an expedited dermatology referral due to multiple ED visits and severe AD.*



DermNet New Zealand (https://dermnetnz.org/images)

https://redcap.ascension.org/txaus/redcap_v12.2.5/Design/online_designer.php?pid=6497&page=atopic_dermatitis_quiz_2

3/21/22, 7:58 PM Educating the Pediatric Emergency Medicine Provider on the Diagnosis and Management of Atopic Dermatitis and Superinfe

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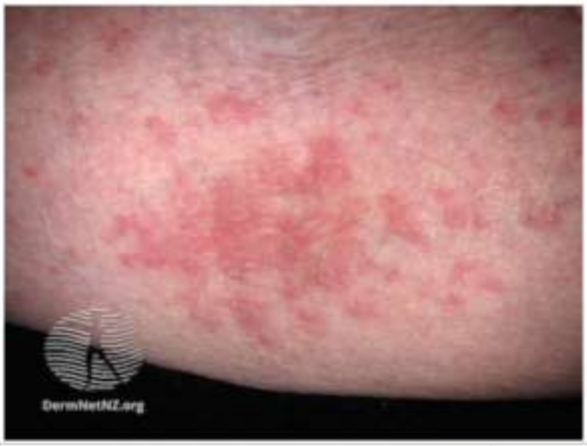
Variable: refderm_severead2_2 *Branching logic: [refderm_severead2] = '4' or [refderm_severead2] = '3' or [refd...*

This patient with severe, refractory atopic dermatitis is being treated by pediatric dermatology with oral cyclosporine. They present to ED with fever and worsening rash. What is the next best step in addition to admission and fever work-up?

Continue cyclosporine, request routine derm follow-up at discharge
Continue cyclosporine, start triamcinolone 0.1% ointment & wet wraps, request expedited derm follow-up at discharge
Continue cyclosporine, request expedited derm follow-up at discharge
Consult dermatology regarding cyclosporine continuation vs discontinuation

**This is severe AD being managed by derm with an immunosuppressant thus presentation with worsening rash and fever warrants a dermatology consultation regarding systemic treatment for AD.*



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Variable: refpcp_modad_2 Branching logic: [refpcp_modad] = '4' or [refpcp_modad] = '3' or [refpcp_modad] ...

This patient presents to the ED stating they have used desonide 0.05% ointment BID for 2 months with minimal improvement. They have not followed up with PCP since desonide was prescribed. What is the next best step?

Admit for steroid augmentation, wet wraps, derm consultation.
Stop desonide, start triamcinolone 0.1% ointment BID x 2 weeks, follow up with PCP
Continue desonide 0.05% ointment, refer to derm for expedited appt
Stop steroids, encourage emollient use, refer to derm for expedited appt

**This is moderate AD not improving on a low potency steroid, thus increasing to a mid potency steroid is indicated. Mild and moderate AD should follow-up with PCP and does not need dermatology referral unless it is not improving with appropriate PCP management after 8-12 weeks or if the patient has multiple ED visits for AD.*

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Variable: skincare2_2 Branching logic: [skincare2] = '5' or [skincare2] = '4' or [skincare2] = '3' or ...

Which of the following should be recommended for a patient with atopic dermatitis?

Lotion rather than cream as it has higher water content
Use of antibiotic soap when bathing to prevent superinfection
Topical products with plant-based fragrances only
Answers A & B
None of the above

**Moisturizers with LOWER water content (ointments, creams) are more occlusive and thus more effective at blocking water loss from the skin in AD. Gentle, fragrance-free soaps are less irritating and drying than antibacterial soaps. Fragrances can be irritating to compromised skin, and they are a common cause of allergic contact dermatitis which patients with AD are more prone to.*

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Variable: feedback2

What aspect of atopic dermatitis do you feel that you need more education on?

Add Field | Add Matrix of Fields

Variable: citations2

References for photos used in this quiz are included here:

Attachment: Q2.docx (0.01 MB)

Citations

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Picture 2: Photo courtesy of DermNet NZ. https://creativecommons.org/licenses/by-nc-nd/3.0/nz/legalcode. No changes made.

Picture 3: Figure 3-26. In: Hurwitz S, Paller AS, Mancini AJ. Hurwitz Clinical Pediatric Dermatology a Textbook of Skin Disorders of Childhood and Adolescence [electronic textbook]. Edinburgh: Elsevier; 2016.

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Current instrument: **Atopic Dermatitis Quiz 3** Preview instrument

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Matrix group: likerthelpful2

Please rate any of the following educational resources or tools you have used since the last quiz:

	Not at all helpful	Slightly helpful	Moderately helpful	Very helpful	Extremely helpful	Did not use
Variable: lect2 **Quick tips/reminders from Quiz 2 (included in email)**	○	○	○	○	○	○
Variable: pearlvid2 **"Atopic Dermatitis 5 Minute Pearl" Youtube video**	○	○	○	○	○	○
Variable: eboc2 **DCMC EBOC Atopic Dermatitis guideline & supporting documents**	○	○	○	○	○	○
Variable: dischvid2 **Atopic Dermatitis: Information for Patients & Families (Video)**	○	○	○	○	○	○
Variable: other2 **Other resources outside of this project**	○	○	○	○	○	○

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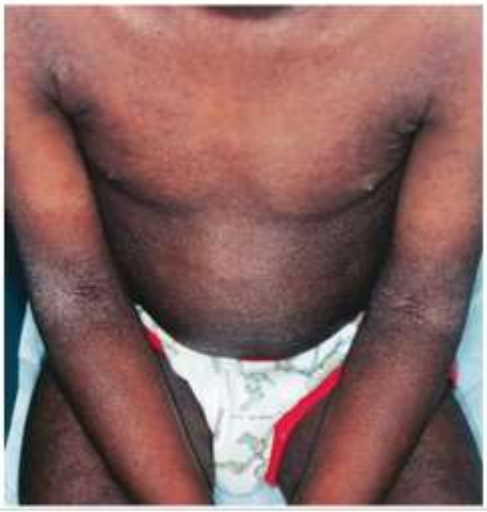
Please answer the following ten questions.



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Variable: dx_severeadaa

How would you classify the skin findings in this patient?

* must provide value

- ○ Mild atopic dermatitis
- ○ Moderate atopic dermatitis
- ○ Severe atopic dermatitis
- ○ Severe atopic dermatitis with bacterial superinfection

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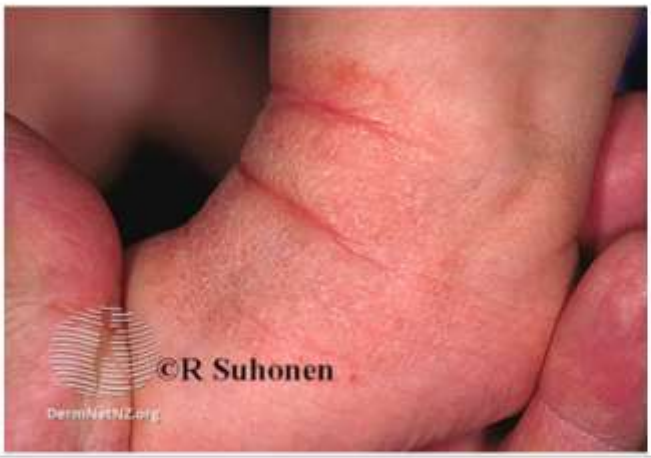
Variable: pic_dx_modad



DermNet New Zealand (https://dermnetnz.org/images)

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Variable: dx_modad

How would you classify the skin findings the in this patient?

- ○ Mild atopic dermatitis
- ○ Moderate atopic dermatitis
- ○ Severe atopic dermatitis
- ○ Moderate atopic dermatitis with bacterial superinfection

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Variable: childad_nopic

Which of the following would you be more likely to see in childhood (1-18 yr) atopic dermatitis rather than infantile (0-1 yr) atopic dermatitis?

* must provide value

- ○ Lichenification
- ○ Involvement of flexural areas such as antecubital fossae, popliteal fossae, etc.
- ○ Dyspigmentation
- ○ Face and scalp involvement
- ○ A, B, C
- ○ B, C, D

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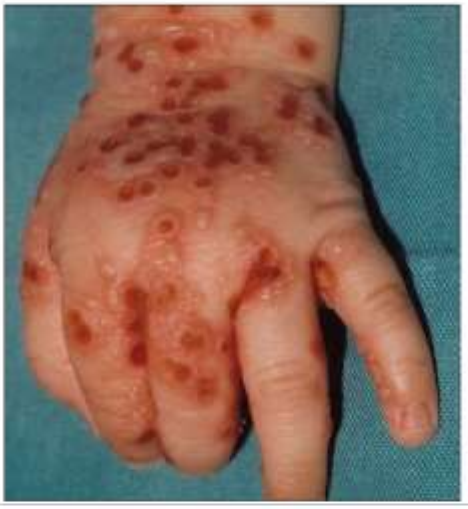
Variable: pic_tx_eh



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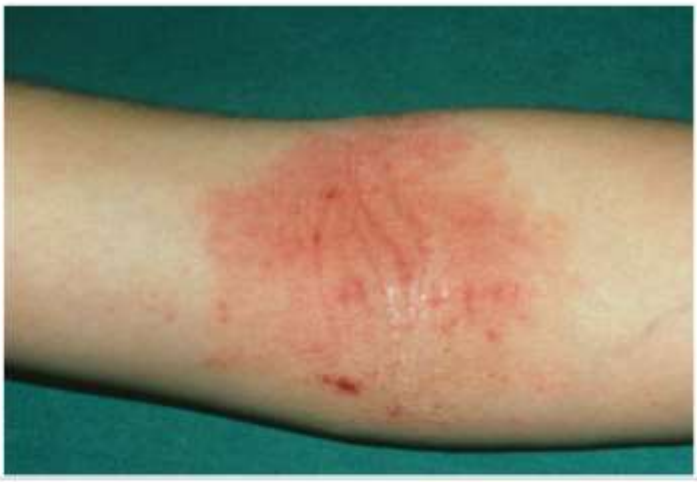
Variable: tx_eh

Please select the most appropriate initial treatment regimen for this patient.

* must provide value

- ○ Swab for HSV PCR; start empiric topical acyclovir BID x 10 days and emollients
- ○ Swab for bacterial culture; start empiric mupirocin 2% TID x 10 days and desonide 0.05% ointment BID x 2 weeks
- ○ Swab for bacterial culture; start empiric cephalexin x 10 days and desonide 0.05% ointment BID x 2 weeks
- ○ Swab for HSV PCR; start empiric oral acyclovir x 10 days



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Variable: tx_modad

This patient has been using hydrocortisone 2.5% cream BID for 14 days with no improvement. What do you change the patient's steroid to?

* must provide value

- ○ Clobetasol 0.05% ointment BID x 2 weeks
- ○ Desonide 0.05% ointment BID x 2 weeks
- ○ Triamcinolone 0.1% ointment BID x 2 weeks
- ○ Hydrocortisone 2.5% ointment BID x 2 weeks

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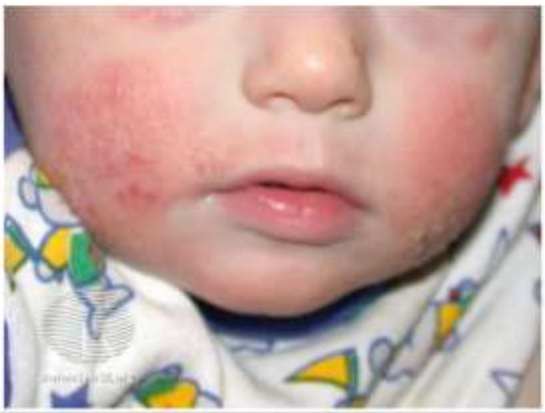
Variable: pic_tx_mildadface



DermNet New Zealand (https://dermnetnz.org/images)

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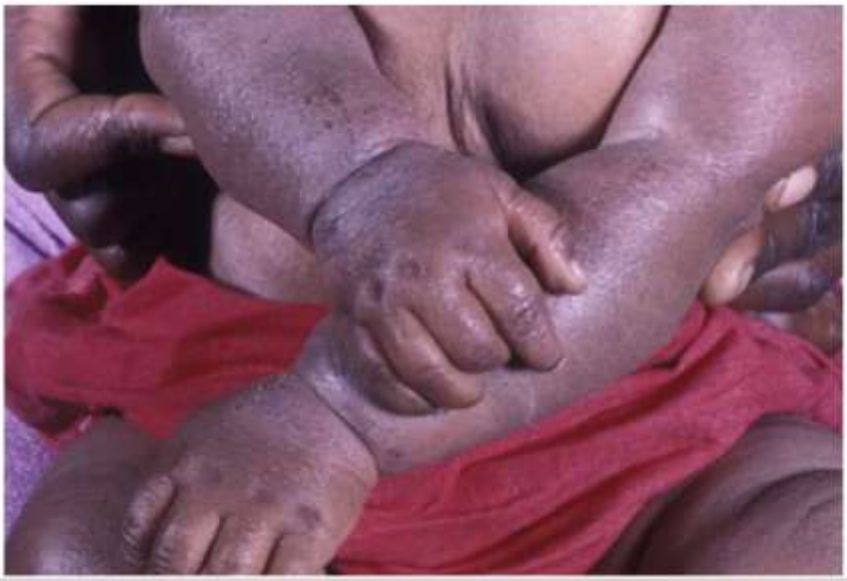
Variable: tx_mildadface

This child's rash is not improving with parents' use of various OTC lotions, creams, and essential oils. What is the next best step in addition to stopping all OTC products?

* must provide value

- ○ Start petroleum jelly applied to face 3-5x daily
- ○ Start hydrocortisone 1% cream BID x 2 weeks, petroleum jelly 3-5x daily
- ○ Start desonide 0.05% ointment BID x 2 weeks, petroleum jelly 3-5x daily
- ○ Start hydrocortisone 2.5% cream BID x 2 weeks, petroleum jelly 3-5x daily



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Variable: refderm_severead3

This patient presents to the ED with atopic dermatitis on most of body. The parents have not been treating. What is the next best step?

* must provide value

- ○ Start hydrocortisone 2.5% ointment BID x 2 weeks, dispense 454 g, follow up with PCP
- ○ Start desonide 0.05% ointment BID x 2 weeks, dispense 60 g, follow up with PCP
- ○ Start triamcinolone 0.1% ointment BID x 2 weeks, dispense 454 g, follow up with PCP, refer to derm for routine appt
- ○ Start mometasone 0.1% ointment BID x 2 weeks, dispense 30 g, follow up with PCP, refer to derm for expedited appt

DermNet New Zealand (https://dermnetnz.org/images)

https://redcap.ascension.org/txaus/redcap_v12.2.5/Design/online_designer.php?pid=6497&page=atopic_dermatitis_quiz_3&__record_cache_complete=1

3/21/22, 8:01 PM Educating the Pediatric Emergency Medicine Provider on the Diagnosis and Management of Atopic Dermatitis and Superinfection at

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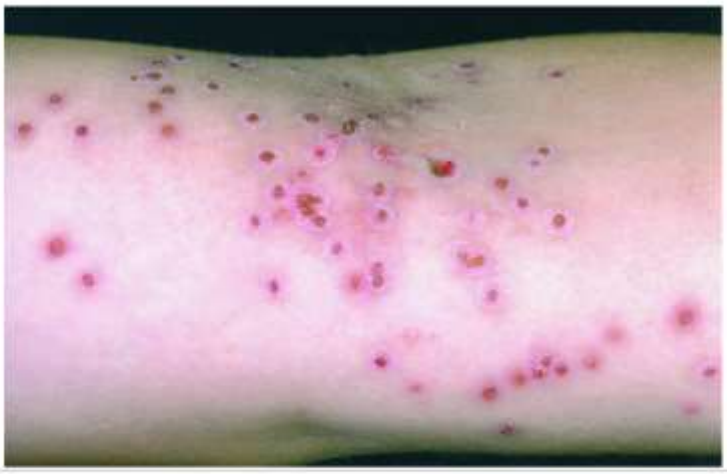
Variable: refpcp_eyelidad

This patient's rash is not improving with use of OTC antibiotic gel. There are other stigmata of atopic dermatitis on exam. What is next best step to treat the rash on the eyelids?

* must provide value

- ○ Swab for bacterial culture, start mupirocin 2% ointment TID x 10 days and desonide 0.05% ointment x 2 weeks, follow-up with PCP
- ○ Swab for bacterial culture, start empiric cephalexin x 10 days and hydrocortisone 2.5% ointment x 2 weeks, refer to pedi derm
- ○ Swab for bacterial culture, start hydrocortisone 1% cream x 2 weeks, refer to pedi derm
- ○ Start hydrocortisone 2.5% ointment x 2 weeks, stop OTC antibiotic gel, follow-up with PCP



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Variable: refderm_eh

This patient has a history of a similar rash that was positive for HSV1 on viral PCR swab. This is the third recurrence of this rash. Patient is afebrile with good oral intake. What is the next best step?

* must provide value

- ○ Admit for IV acyclovir and consult dermatology
- ○ Discharge with 10 days of acyclovir and triamcinolone 0.1% ointment BID x 2 weeks, follow-up with PCP
- ○ Discharge with 10 days of acyclovir and triamcinolone 0.1% ointment BID x 2 weeks, refer to derm for routine appt
- ○ Consult dermatology for recommendations on treatment prior to discharge

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Variable: skincare3

When counseling your patients on over-the-counter products for atopic dermatitis, what do you recommend?

* must provide value

- ○ A. Bland lotions and gels
- ○ B. All natural, organic products
- ○ C. Fragrance free products
- ○ A & B
- ○ B & C

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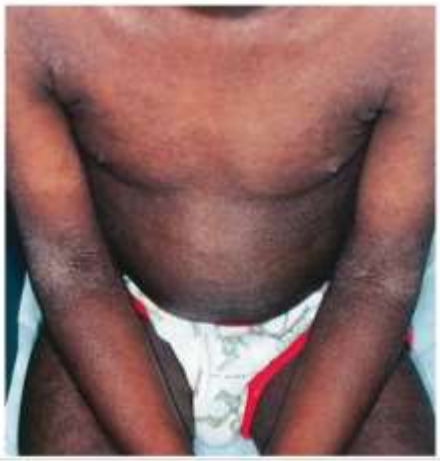
The following are the questions you answered INCORRECTLY. The correct answers are highlighted.

If there are no questions shown here, you selected all of the correct answers!



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Variable: dx_severeadaa_2 *Branching logic: [dx_severeadaa] = '2' or [dx_severeadaa] = '3' or [dx_severeada...*

How would you classify the skin findings in this patient?

Mild atopic dermatitis
Moderate atopic dermatitis
Severe atopic dermatitis
Severe atopic dermatitis with bacterial superinfection

**AD in skin of color can be more difficult to recognize, however this patient has xerotic, eczematous plaques covering the majority of his body.*

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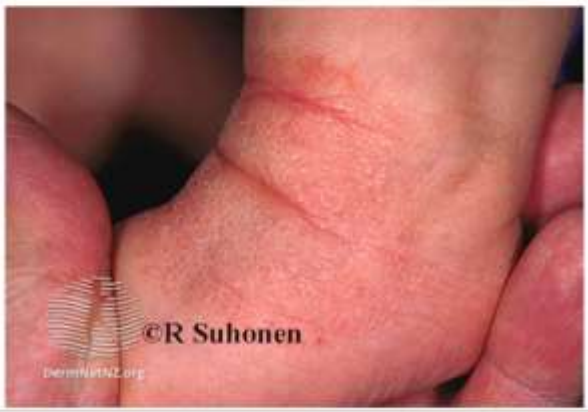
Variable: pic_dx_modad_2 *Branching logic: [dx_modad] = '2' or [dx_modad] = '3' or [dx_modad] = '4'*



DermNet New Zealand (https://dermnetnz.org/images)

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Variable: dx_modad_2 *Branching logic: [dx_modad] = '2' or [dx_modad] = '3' or [dx_modad] = '4'*

How would you classify the skin findings the in this patient?

Mild atopic dermatitis
Moderate atopic dermatitis
Severe atopic dermatitis
Moderate atopic dermatitis with bacterial superinfection

**This is best decribed as moderate AD. Though it appears localized, it is a confluent, well-defined eczematous plaque with significant inflammation.*

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Variable: childad_nopic_2 Branching logic: [childad_nopic] = '2' or [childad_nopic] = '3' or [childad_nopi...

Which of the following would you be more likely to see in childhood (1-18 yr) atopic dermatitis rather than infantile (0-1 yr) atopic dermatitis?

2, A. Lichenification
3, B. Involvement of flexural areas such as antecubital fossae, popliteal fossae, etc.
4, C. Dyspigmentation
5, D. Face and scalp involvement
1, A, B, C
6, B, C, D

**As opposed to babies in which AD is common on the extensor surfaces, face, and scalp, AD in children & adults typically involves the flexural surfaces such as the AC fossae and popliteal fossa. In addition, thickening of the skin (lichenification) and changes in pigment suggest a more chronic course that babies haven't had time to develop.*

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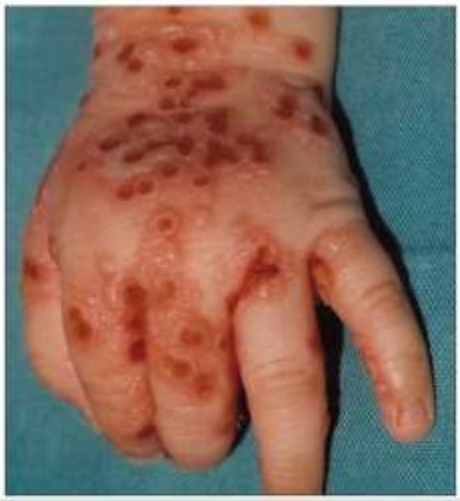
Variable: pic_tx_eh_2 Branching logic: [tx_eh] = '2' or [tx_eh] = '3' or [tx_eh] = '4'



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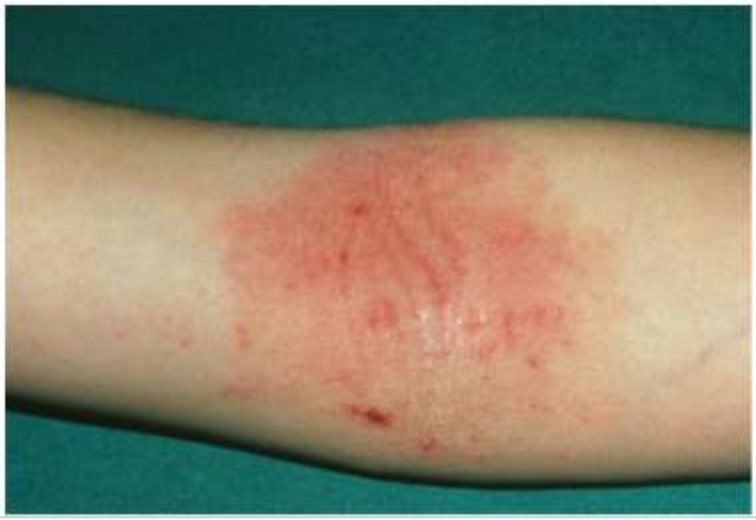
Variable: tx_eh_2 Branching logic: [tx_eh] = '2' or [tx_eh] = '3' or [tx_eh] = '4'

Please select the most appropriate initial treatment regimen for this patient.

Swab for HSV PCR; start empiric topical acyclovir BID x 10 days and emollients
Swab for bacterial culture; start empiric mupirocin 2% TID x 10 days and desonide 0.05% ointment BID x 2 weeks
Swab for bacterial culture; start empiric cephalexin x 10 days and desonide 0.05% ointment BID x 2 weeks
Swab for HSV PCR; start empiric oral acyclovir x 10 days

**The punched-out erosions are typical of eczema herpeticum, thus the provider should perform an HSV PCR test by swabbing the base of a fresh blister if present, otherwise the base of a wet erosion. Because the appearance is classic, it would be prudent to start empiric oral acyclovir. Topical acyclovir is not recommended.*



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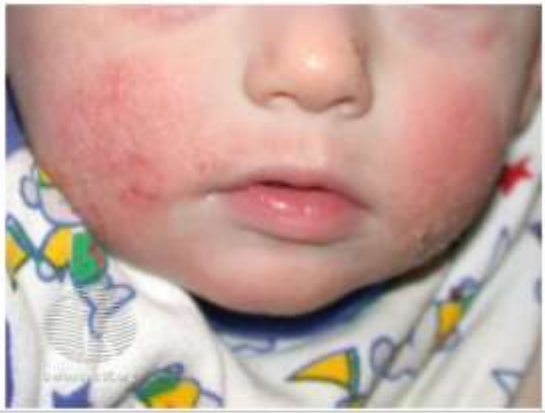
Variable: tx_modad_2 *Branching logic:* [tx_modad] = '2' or [tx_modad] = '3' or [tx_modad] = '4'

This patient has been using hydrocortisone 2.5% cream BID for 14 days with no improvement. What do you change the patient's steroid to?

Clobetasol 0.05% ointment BID x 2 weeks *(very high potency)*
Desonide 0.05% ointment BID x 2 weeks *(low potency)*
Triamcinolone 0.1% ointment BID x 2 weeks *(medium potency)*
Hydrocortisone 2.5% ointment BID x 2 weeks *(low potency)*

**This patient has moderate AD failing a low potency steroid thus increasing to a medium potency steroid is appropriate.*



DermNet New Zealand (https://dermnetnz.org/images)

https://redcap.ascension.org/txaus/redcap_v12.2.5/Design/online_designer.php?pid=6497&page=atopic_dermatitis_quiz_3&__record_cache_complete=1

3/21/22, 8:01 PM Educating the Pediatric Emergency Medicine Provider on the Diagnosis and Management of Atopic Dermatitis and Superinfecti

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Variable: tx_mildadface_2 *Branching logic:* [tx_mildadface] = '2' or [tx_mildadface] = '3' or [tx_mildadfac...

This child's rash is not improving with parents' use of various OTC lotions, creams, and essential oils. What is the next best step in addition to stopping all OTC products?

Start petroleum jelly applied to face 3-5x daily
Start hydrocortisone 1% cream BID x 2 weeks, petroleum jelly 3-5x daily *(very low potency/OTC)*
Start desonide 0.05% ointment BID x 2 weeks, petroleum jelly 3-5x daily *(low potency)*
Start hydrocortisone 2.5% cream BID x 2 weeks, petroleum jelly 3-5x daily *(low potency)*

**This is mild AD on the face, likely exacerbated by food and saliva as the baby is transitioning to solid food. Treatment would include a low potency steroid ointment (not cream) to calm the inflammation and vaseline throughout the day to protect skin from saliva and food.*

Add Field | Add Matrix of Fields

Variable: refderm_severead4 *Branching logic:* [refderm_severead3] = '3' or [refderm_severead3] = '2' or [refd...

This patient presents to the ED with atopic dermatitis on most of body. The parents have not been treating. What is the next best step?

Start hydrocortisone 2.5% ointment BID x 2 weeks, dispense 454 g, follow up with PCP
Start desonide 0.05% ointment BID x 2 weeks, dispense 60 g, follow up with PCP
Start triamcinolone 0.1% ointment BID x 2 weeks, dispense 454 g, follow up with PCP, refer to derm for routine appt
Start mometasone 0.1% ointment BID x 2 weeks, dispense 30 g, follow up with PCP, refer to derm for expedited appt

**This is severe AD covering the majority of the body, thus a triamcinolone (medium potency but able to be dispensed in 454 g jar) is the most appropriate answer. Though mometasone is a high potency steroid and would be reasonable, 30 grams is not sufficient to treat an entire body for more than a day or two. This patient warrants a routine dermatology referral as they have not been on appropriate medical management.*

Variable: refpcp_eyelidad2 Branching logic: [refpcp_eyelidad] = '2' or [refpcp_eyelidad] = '3' or [refpcp_e...

This patient's rash is not improving with use of OTC antibiotic gel. There are other stigmata of atopic dermatitis on exam. What is next best step to treat the rash on the eyelids?

Swab for bacterial culture, start mupirocin 2% ointment TID x 10 days and desonide 0.05% ointment x 2 weeks, follow-up with PCP
Swab for bacterial culture, start empiric cephalexin x 10 days and hydrocortisone 2.5% ointment x 2 weeks, refer to pedi derm
Swab for bacterial culture, start hydrocortisone 1% cream x 2 weeks, refer to pedi derm
Start hydrocortisone 2.5% ointment x 2 weeks, stop OTC antibiotic gel, follow-up with PCP

**This is moderate dermatitis of the eyelid. The scale should not be mistaken for honey-crusted erosions that would suggest infection. This may represent the patient's AD or it may be contact dermatitis from the antibiotic gel, however the best treatment is a low potency steroid ointment (given location on face), cessation of antibiotic gel, and follow-up with PCP.*

Add Field Add Matrix of Fields

Variable: pic_refderm_eh_2 Branching logic: [refderm_eh] = '4' or [refderm_eh] = '3' or [refderm_eh] = '2'

Image

Add Field Add Matrix of Fields

Variable: refderm_eh_2 Branching logic: [refderm_eh] = '4' or [refderm_eh] = '3' or [refderm_eh] = '2'

This patient has a history of a similar rash that was positive for HSV1 on viral PCR swab. This is the third recurrence of this rash. Patient is afebrile with good oral intake. What is the next best step?

Admit for IV acyclovir and consult dermatology
Discharge with 10 days of acyclovir and triamcinolone 0.1% ointment BID x 2 weeks, follow up with PCP
Discharge with 10 days of acyclovir and triamcinolone 0.1% ointment BID x 2 weeks, follow up with PCP, routine derm referral
Consult dermatology for recommendations on treatment prior to discharge

**This is eczema herpeticum on the arm of an an otherwise well-appearing patient thus discharge with po acyclovir and a medium potency topical steroid is appropriate. Given the history of recurrences of this rash, a routine dermatology referral is warranted.*

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Variable: skincare4 Branching logic: [skincare3] = '2' or [skincare3] = '3' or [skincare3] = '4' or ...

When counseling your patients on over-the-counter products for atopic dermatitis, what do you recommend?
A. Bland lotions and gels
B. All natural, organic products
C. Fragrance free products
D. A & B
E. B & C

Adherence to a gentle skin care regimen can decrease AD flares. This includes the aggressive use of **thick, bland, fragrance-free moisturizers (i.e. **ointments and creams**). Lotions and gels are drying and can sting. Soaps and cleansers should be mild and fragrance free as well. Many products that are marketed as "all natural" or "organic" contain plant oils, fragrance, and other herbal ingredients that are quite irritating for AD.*

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Add Field Add Matrix of Fields

Variable: feedback3

What aspect of atopic dermatitis do you feel that you need more education on?

* must provide value

Citations
Picture 1: In: Runge MS, Greganti MA, Netter FH. Netter's Internal Medicine [online textbook]. Philadelphia: Saunders/Elsevier; 2009.
Picture 2: Photo courtesy of DermNet NZ. https://creativecommons.org/licenses/by-nc-nd/3.0/nz/legalcode. No changes made.
Picture 3: Stricker T, Lips U, Sennhauser FH. Visual Diagnosis. American Academy of Pediatrics. https://pedsinreview.aappublications.org/content/28/6/231. Published June 1, 2007. Accessed January 9, 2020.
Picture 4: Eczema Pictures: What an Eczema Rash Looks Like. WebMD. https://www.webmd.com/skin-problems-and-treatments/eczema/ss/slideshow-eczema-overview. Accessed January 9, 2020
Picture 5: Photo courtesy of DermNet NZ. https://creativecommons.org/licenses/by-nc-nd/3.0/nz/legalcode. No changes made.
Picture 6: Eczema Pictures: What an Eczema Rash Looks Like. WebMD. https://www.webmd.com/skin-problems-and-treatments/eczema/ss/slideshow-eczema-overview. Accessed January 9, 2020
Picture 7: Photo courtesy of DermNet NZ. https://creativecommons.org/licenses/by-nc-nd/3.0/nz/legalcode. No changes made.
Picture 8: Healthcare Information Network. http://healthncare.info/eczema-herpeticum-symptoms-treatment/. Accessed June 7, 2020.

Exit Survey

Please complete the brief exit survey below.

Thank you!

For the following, please choose how much you agree or disagree with the statements.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel confident in accurately diagnosing pediatric patients who present to the ED with atopic dermatitis.	○	○	○	○	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel confident in accurately diagnosing pediatric patients who present to the ED with bacterial superinfection.	○	○	○	○	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel confident in accurately diagnosing pediatric patients who present to the ED with eczema herpeticum.	○	○	○	○	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel confident in prescribing the appropriate topical steroid according to severity of atopic dermatitis.	○	○	○	○	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel confident in prescribing the appropriate treatment for bacterial superinfection.	○	○	○	○	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel confident in prescribing the appropriate treatment for eczema herpeticum.	○	○	○	○	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree

I feel confident in determining if a patient with atopic dermatitis should follow-up with primary care provider vs pediatric dermatology.	○	○	○	○	○

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I feel confident in counseling patients with atopic dermatitis on gentle skin care practices (i.e. choosing moisturizer, bathing, avoidance of triggers, etc).	○	○	○	○	○

Appendix B. *YouTube educational videos For Clinicians*

Learning resource-link for YouTube videos

https://www.youtube.com/channel/UCJz81tt9YRpVTZ_CrHjLXxQ

Appendix C. *Atopic Dermatitis Education and Care Plan For Patients*

Atopic Dermatitis/Eczema Care

Pediatric and Adolescent Dermatology

SCAN ME

Scan here to watch an educational video on atopic dermatitis!

Atopic Dermatitis, also known as **eczema**, is a common chronic skin problem in children.

- Eczema is a stressful disease for children and families. It can flare up unexpectedly and causes significant itching.
- There is no cure for eczema, but it can usually be managed by following a daily skincare routine. The right kind of skin care helps control the symptoms and prevents complications.
- Eczema will often improve as children get older. Some will even outgrow the condition completely.

What causes eczema?

- The exact cause is unknown but it is at least partly caused by genetics (inherited).
- The main function of the skin is to provide a protective barrier. In patients with eczema, this barrier is inadequate and the skin is easily irritated and dry.
- Another main function of the skin is as a first defense in the immune system. In eczema, the immune system reacts differently than in people with normal skin. The immune system can be overactive, causing redness and swelling even though there is no infection.
- Eczema can also be related to other "allergic" or "atopic" conditions, including allergies, asthma, and hay fever.

Symptoms of Eczema

- People with eczema have very dry skin. The dry skin itches and may crack, and the cracked skin can become infected. When the eczema flares up, the skin may look red and irritated.
- On infants and young children, patches of eczema may ooze and look "weepy." A child's face, body, and the outside of the arms and legs are most likely to be affected.
- In older children, the skin may appear thick and scaly. Areas of skin folds such as the neck, underarms, and behind the knees are commonly affected, however eczema can be anywhere on the body.

Eczema and Allergies

- Some children with eczema have respiratory allergies, environmental allergies or asthma, and a few children have food allergies.

- If your child has allergies, the eczema may flare up when he or she has an allergic reaction. If your child has eczema but does not have any other symptoms of allergy, we do not usually recommend allergy testing. In most cases, it is not helpful.

Eczema Triggers

- Change of seasons AND/OR very hot or cold weather
- Allergens: dust mites, grass, pet fur/dander
- Irritants: tobacco smoke, wool/synthetic fabrics like nylon, saliva (from drooling), certain chemical ingredients
- Fragrance (something that makes a product smell good) is another common trigger of eczema. Many cosmetic and household products contain fragrance including: moisturizers, shampoos, soaps, laundry detergents, fabric softeners. It is important to use only products that are fragrance-free. Unscented products are NOT the same as fragrance-free and often contain extra "masking" fragrance.

Managing Eczema

- It is important to remember that there is no cure for eczema. Most parents find that they can control their child's eczema by following the daily skin care routine that is outlined in this information sheet.
- *The most important* part of the routine is to keep your child's skin moist so it does not dry out. It may take some trial and error to find what skin moisturizers work best for your child.

Skin Care Routine for Your Child

1) *Baths.* A daily bath is helpful for some children with eczema. In these children, you may find it helpful to do longer, lukewarm baths daily. However some children seem to flare with bathing. In these cases, try to limit the bath to a maximum of ten minutes every 1-3 days. Always use lukewarm water, as hot water removes the natural oils from your child's skin and contributes to dryness.

a. Use as little soap as possible. Use soap only on areas of your child's body that get dirty or smell bad (i.e. underarms, hands, feet, and bottom). Use a mild soap from the list below. Many soaps can be harsh and remove the skin's natural oils.

b. Pat your child semi-dry after the bath. Do not rub. Rubbing will irritate the skin.

c. Occasionally your doctor may instruct you to add a small amount of household bleach to the bathwater to decrease infections.

2) *Moisturizer*

a. Apply a moisturizer to the entire body immediately after the bath while the skin is still wet. Moisturizer keeps the skin from drying out. Use the moisturizer everywhere, not just on the affected areas. Remember, children with eczema have dry skin all over, and putting moisturizer everywhere can keep the eczema from flaring or getting worse.

b. Apply moisturizer at least twice during the day. Moisturizer should be applied twice daily even when the skin appears normal. Some children may need 3-5 applications per day.

c. In addition, apply moisturizer any time the skin is dry or flaky or any time your child feels itchy. Many parents note the skin looks dry shortly after moisturizing - it is still working and necessary to continue.

3) *Avoid triggers.*

a. Some triggers are difficult to avoid, such as change in seasons, dust mites, and dander.

b. Other triggers are more easily avoided such as fragrance, tobacco smoke, and synthetic fibers.

c. Remember that many natural, organic ingredients can still be irritating to children with eczema.

d. A good rule of thumb is that if the product smells nice, it is probably not the right choice for a child with eczema.

e. Saliva is often a trigger for babies as they are teething and learning to eat solid food. To avoid the effect of saliva on the skin, apply a layer of ointment (i.e. Vaseline or Aquaphor) around the mouth frequently throughout the day and before feedings.

Choosing a Soap or Cleanser

Some soap(s) are less irritating and drying than others. You may need to try several before you find a soap that does not irritate your child's skin. The soaps listed below have worked for other families. You can find them in most grocery stores. Make sure the soap or cleanser you use on your child is always fragrance free.

- Dove Sensitive Skin Bar Soap or Body Wash
- Cerave Hydrating Cleansing Bar or Hydrating Body Wash
- Cetaphil Gentle Cleansing Bar or Gentle Skin Cleanser or Ultra Gentle Body Wash
- Vanicream Cleansing Bar or Gentle Body Wash
- Aveeno Moisturizing Bar or Skin Relief Body Wash
- Aveeno products often contain oat extract which can calm inflammation in eczema
- Aquaphor Baby Gentle Wash & Shampoo
- Purpose Gentle Cleansing Bar

Choosing a Moisturizer

It can be overwhelming to choose a moisturizer. Ointments work better than creams, but sometimes are too sticky during the day. You might want to use a cream during the day and an ointment at night. Creams/ointments come in a jar or tub and will work better than lotions that are in bottles or pumps. Any moisturizer works best when applied to damp skin because a seal is formed, holding water in the skin.

Just like soaps, make sure that the product is fragrance-free (not unscented). Some moisturizers that often work well are listed here. You can buy them at pharmacies or grocery stores.

- Vanicream Moisturizing Cream
- Cerave Moisturizing Cream
- Cetaphil Moisturizing Cream Aquaphor Healing Ointment
- Vaseline Petroleum Jelly

- Vanicream Moisturizing Ointment
- Aveeno Skin Relief Moisture Repair Cream
- Aveeno Cracked Skin Relief Cica Balm
- Eucerin Eczema Relief Cream

Itching

Itching is a difficult part of eczema. Most of the time you can control your child's itching by following a good daily skin care regime. There are some additional steps you can take when your child's itching gets worse.

- Apply moisturizer every time your child's skin looks or feels dry. For severe itching, try putting a damp, cool washcloth on the affected skin.
- You can also try giving your child an antihistamine for itching. Benadryl (diphenhydramine) is available without a prescription and often works well. If you are not sure what dose to use, please call your doctor. This medicine often causes sleepiness so it is most useful for nighttime itching.
- Unless your child has environmental allergies that cause their eczema to worsen, other antihistamines such as Zyrtec (cetirizine) or Allegra (loratadine) are unlikely to help with your child's itching.
- Please do not use any topical anti-itch medications without asking your doctor as they can be very irritating to the skin.
- Distraction techniques can also be used when your child is itching.

Prescribed topical medications

Topical medications are often prescribed to control itching and reduce redness (inflammation). The medication should be applied directly to the skin before a plain moisturizer, no more than twice daily. It will NOT work better if used more often than twice daily. You should put a small amount of the medication on your fingertip and gently rub a thin layer into the rash areas only. You should try to avoid normal skin.

Prescription topical medications are often steroid medications or non-steroid medications (Protopic/tacrolimus or Elidel/pimecrolimus). All of these medications work to decrease the inflammation that leads to redness and itching.

Non-steroid medications are "controllers" and should be used at the first sign of rash. Steroid medicines vary in strength and your doctor will provide you with specific instructions for how, when, and where to use them. In general, you should not use stronger steroids on the face, genitals, or underarms unless your doctor instructs you to do so.

Flare-Ups

There may be times when your child's eczema will worsen. When your child has a flare-up, his or her skin may:

- Become red or irritated
- Ooze or look weepy
- Itch more than normal

Flare-ups can happen anytime, and many different things can cause them. Flare-ups may happen:

- When the weather changes
- When your child is sick
- When your child is under emotional stress When your child has contact with a trigger
- For no apparent reason

Wet Wraps

Wet wraps are a very effective way to calm down a flare and can be done before calling the doctor. They can be done one to two times a day.

- First apply topical steroid to areas of rash THEN apply a thick moisturizer to all areas of skin.
- For infants and toddlers, take a pair of long-sleeved, long-legged pajamas and run under warm water. Wring out excess water.
- For older children, warm, moist towels, long socks, long johns, etc. can be used to wrap the skin.
- Warm, moist socks can be used for wraps on hands and feet.
- Anything used should be 100% cotton.
- Put warm, wet pajamas on the child, then cover with a dry set of pajamas or wrap in a dry towel or blanket.
- Leave on for several hours or overnight.
- Remove the wet pajamas and apply additional moisturizer.
- If only certain areas are flaring (i.e. elbows, knees, etc) "spot treatments" can be done instead of full body wet wraps.

Infections

Children with eczema are more likely to get skin infections. These infections can be caused by a bacteria, virus, or fungus. Watch for any of these signs of infection:

- Fever
- Redness
- Swelling
- Drainage or weepy skin
- Blisters
- Pus bumps
- Scabbing

If your child develops any of these symptoms, please your doctor. We may need to see him or her to decide what treatment will be best. If you are concerned your child may have a skin infection and is acting ill/has fever, they should be seen urgently by their primary care doctor, dermatologist, or possibly in an emergency room.

For School-Age Children

School-age children can learn to care for their skin at school. However, they will need the cooperation of their teachers. It helps if teachers understand that eczema is not contagious.

- Your child should carry moisturizer to apply any time he or she starts itching.
- Any time your child exercises enough to sweat, even at recess, he or she should pat dry and apply more moisturizer.

Other Ways to Help Your Child

Most children do best in loose-fitting, cotton clothing. It can also help to wash new clothes before your child wears them. Keep the temperature in your house steady and comfortable for your child. Children who have eczema often feel better if they are somewhat cooler. Frequent changes in the temperature may cause flare-ups. Do not use wet wipes as they may dry out the skin.

For Other Caregivers

If your child has a sitter or goes to daycare, you will need to give special instructions to these caregivers. It is important to help them understand that your child's eczema is not contagious. Ask them to:

- Apply moisturizer on a schedule.
- Massage additional moisturizer into the affected area if your child starts itching.
- Give any medications prescribed by your doctor as directed.

When to Call the Doctor

Please call your doctor's office if you notice any of the following:

- Your child's skin seems worse even though you are adhering to the gentle skin care routine and using topical medications as directed.
- Your child has signs of a skin infection including blisters, pus bumps, or drainage.
- You have any questions about your child's condition or care plan.

Eczema Medication Instructions

1. Moisturize ALL skin

Apply a thick, fragrance-free moisturizer at least two times daily. Ointments are better than creams.

2. Apply topical anti-inflammatories to ONLY AREAS WITH ECZEMA (i.e. red, rough, raised, itchy areas)

STEROIDS

Face	Scalp	Body/Arms/Legs
Hydrocortisone 2.5%	Fluocinolone 0.01%	Triamcinolone 0.1%
Desonide 0.05%	Fluocinonide 0.05%	Mometasone 0.1%
Triamcinolone 0.025%	Mometasone 0.1%	Clobetasol 0.05%
Other:	Clobetasol 0.05%	Betamethasone
	Other:	Other:
For flares, the above medications should be used 2x/day for up to 14 days. For maintenance, the above medications can be used 2-3 days per week.		

Itch Medicine by Mouth

Take _____of_____by mouth every_____ hours as needed for itching.

Antibiotics/Antivirals

Apply_____ to open sores, yellow crusted areas, or pus bumps_____x/day for_____ days.

Take_____of_____by mouth_____x/day for_____days.

Bleach Baths (also known as "swimming pool baths")

Add 1/4 cup of household bleach to a full tub of lukewarm bathwater 2-3 times per week.

Dry and Sensitive Skin Care Products

Pediatric and Adolescent Dermatology

Moisturizers

Moisturizers should be used regularly, even if skin does not appear dry. Lotions are NOT recommended due to their high alcohol and water content.

- **Ointments** (Best):
    - Vaseline Petroleum Jelly
    - Aquaphor Healing Ointment
    - Vanicream Moisturizing Ointment

- **Creams** (Good):
    - Cerave Moisturizing Cream
    - Cetaphil Moisturizing Cream
    - Vanicream Moisturizing Cream
    - Aveeno Skin Relief Moisture Repair Cream
    - Eucerin Eczema Relief Cream

Skin cleansers/soaps

Use only on areas of the body that are visibly soiled or odorous (i.e. groin, underarms, buttocks). Use only fragrance-free soaps and cleansers. Avoid Johnson's Baby products as these contain heavy fragrance.

- Dove Sensitive Skin Bar Soap or Body Wash
- Cerave Hydrating Cleansing Bar or Hydrating Body Wash
- Cetaphil Gentle Cleansing Bar or Gentle Skin Cleanser or Ultra Gentle Body Wash
- Vanicream Cleansing Bar or Gentle Body Wash
- Aveeno Moisturizing Bar or Skin Relief Body Wash
- Aquaphor Baby Gentle Wash & Shampoo
- Purpose Gentle Cleansing Bar

Laundry Detergents

Use fragrance-free laundry detergents. Avoid use of fabric softeners as they can leave deposits on fabrics that can be irritating to patients with eczema.

- Tide Free
- Cheer Free
- All Free Clear
- Arm & Hammer Perfume and Dye Free Liquid

Scan here for a brief educational video with more information on atopic dermatitis!