

## Supplementary guide on diagnostic criteria, severity assessment tools and mitigation strategies for common triggers



The supplementary guide accompanies the ACE Clinical Guideline 'Mild and moderate atopic dermatitis (eczema) – a journey from flare to care'. It presents the validated United Kingdom Working Party criteria and Hanifin and Rajka diagnostic criteria in full, with their limitations for application.

### UK Working Party diagnostic criteria<sup>1-3</sup>

#### *Must fulfil 1 major criteria + 3 minor criteria*

##### Major criteria (1):

- Itchy skin

##### Minor criteria (5):

- History of dry skin in the last 12 months
- Onset under the age of 2 years (do not use if children  $\leq 4$  years)
- History of involvement of skin creases such as folds of elbow, behind the knees, fronts of ankles or around the neck (including cheeks and/or extensor areas in children  $\leq 10$  years)
- Visible flexural dermatitis (or dermatitis on the cheeks/ forehead and extensor areas in children  $\leq 4$  years)
- Personal history of asthma or allergic rhinitis (or history of atopic disease in a first-degree relative of children  $\leq 4$  years)

Limitations: Asians with AD may present with atypical morphology and distribution of lesions, and the focus on flexural dermatitis may reduce diagnostic sensitivity.<sup>4</sup> With the rise of late-onset AD particularly in the Chinese population,<sup>4,5</sup> and potential recall inaccuracy among adult patients,<sup>4,6</sup> the focus on 'onset under the age of 2 years' inherently decreases sensitivity.<sup>5</sup> UKWP criteria also has lower sensitivity in infants as they cannot verbalise itch (a major criterion), and flexural involvement is less prominent at this age.<sup>7</sup>

### Hanifin and Rajka diagnostic criteria<sup>8</sup>

#### *Must fulfil at least 3 major criteria and 3 minor criteria*

##### Major criteria (4):

- Itchy skin
- Typical morphology and distribution
- Chronic or chronically relapsing course
- Personal or family history of atopy

##### Minor criteria (23):

- Dry skin
- Early age of onset
- Cheilitis
- Anterior subcapsular cataracts
- Anterior neck folds
- IgE-mediated food allergy
- Ichthyosis/palmar hyperlinearity/ keratosis pilaris
- Tendency toward cutaneous infections (e.g. *S aureus* and herpes simplex)/ impaired cell-mediated immunity
- Recurrent conjunctivitis
- Orbital darkening
- Itch when sweating
- Course influenced by environmental/ emotional factors
- Immediate (type I) skin test reactivity
- Tendency toward nonspecific hand or foot dermatitis
- Dennie-Morgan infraorbital fold
- Facial pallor/facial erythema
- Intolerance to wool and lipid solvents
- White dermographism/ delayed blanch
- Elevated serum IgE
- Nipple eczema
- Keratoconus
- Pityriasis alba
- Perifollicular accentuation

Limitations: Used primarily in research studies due to its complex and exhaustive nature.<sup>9,10</sup> Some criteria require more clinical experience for identification or additional examinations (e.g. serum IgE, skin test reactivity) that limit utility in clinical practice. Studies have also questioned the diagnostic significance of some minor criteria.<sup>10-12</sup>

IgE, Immunoglobulin E.

The following optional validated scoring tools provide standardised measurement of disease severity for more detailed AD assessment, or occasionally, when clinicians wish to confirm whether a case is progressing beyond what is typically manageable in primary care. Each tool includes a hyperlink to an online calculator or form to facilitate clinical use.

Tools	Scores for severity classification		
	Mild AD	Moderate AD	Severe AD
<a href="#">EASI</a> – For signs	0.1–5	6–22	23–72
<a href="#">SCORAD</a> – For signs and symptoms like itch, sleeplessness	10–28	29–48	49–103
<a href="#">POEM</a> – Questionnaire to ask about symptoms	0–7	8–16	17–28
DLQI, CDLQI, IDQoL - Questionnaire to ask about quality of life	0–5	6–10	11–30
Numerical rating scale (NRS) on a scale of 1 to 10, to ask about itch, sleeplessness	More subjective		

The table S1 expands on trigger factor for atopic dermatitis, along with practical and evidence-based mitigation strategies to support patient education and self-management.

**Table S1.** Triggers and mitigation strategies

Triggers	Mitigation strategies (non-exhaustive)
 <p><b>Extreme hot, cold or dry weather conditions</b> creates a U-shaped curve linking temperature extremes to increased AD risk.<sup>13</sup> Extreme cold and dry conditions triggers an inflammatory response cascade, while hot weather with or without increased humidity increase sweating,<sup>13</sup> which promotes transepidermal water loss and skin dryness.<sup>14</sup> <b>Dried sweat residue</b> traps contaminants and clogs sweat pores, causing more skin irritation.<sup>15</sup></p>	<ul style="list-style-type: none"> <li>• When travelling to very cold climates or staying in heavily air-conditioned spaces, ensure frequent application of moisturisers</li> <li>• Use humidifiers in heavily air-conditioned rooms</li> <li>• Wear loose, breathable clothing on very hot days or during exercise</li> <li>• After sweating, shower with lukewarm water when possible (avoiding long, hot showers that dry the skin), or at least wipe away excess sweat with a wet towel and rinse both wrists and skin folds<sup>15</sup></li> </ul>
 <p><b>House dust mites</b> are a common AD trigger in Singapore, with 48% of patients reporting them as an aggravating factor.<sup>16</sup> Evidence on avoidance strategies is mixed, with systematic reviews showing limited benefits in reducing severity or preventing AD, but they are considered low-risk interventions that may benefit sensitive patients.<sup>17,18</sup></p>	<ul style="list-style-type: none"> <li>• Increase ventilation in living spaces to reduce dust mite accumulation<sup>19</sup></li> <li>• Using wet dusting instead of dry dusting to minimise spread of dust and allergens<sup>19</sup></li> <li>• Vacuum frequently but as vacuuming can stir up dust and causing them to become airborne, high-efficiency particulate arresting (HEPA) air filters may help<sup>19</sup></li> <li>• Sun-dry bedding regularly as heat and UV exposure help eliminate dust mites<sup>19</sup></li> <li>• Reduce soft furnishings and toys that can harbour dust mites<sup>20,21</sup></li> </ul>
 <p><b>Pet dander</b> carries allergenic proteins from animal's fur, saliva, urine and sebaceous secretion, which can trigger AD flares in sensitised patients.</p>	<ul style="list-style-type: none"> <li>• While pet removal offers the most effective long-term control,<sup>22</sup> households who choose to keep pets should focus on:<sup>22,23</sup> <ul style="list-style-type: none"> <li>◦ Maintain clean, well-ventilated environment throughout the house</li> <li>◦ Restrict pets from bedrooms</li> <li>◦ Clean dogs and cats weekly</li> <li>◦ Have a non-allergic family member brush pets outdoor regularly to reduce indoor dander accumulation</li> <li>◦ Wash hands after handling pets</li> <li>◦ Vacuum frequently</li> </ul> </li> </ul>
 <p><b>Insect bites</b> can trigger AD through IgE-mediated allergic reactions that cause immune activation and inflammation that worsen AD.<sup>24</sup> The resulting itch causes patients to scratch, further aggravating the itch-scratch cycle.</p>	<ul style="list-style-type: none"> <li>• Use fragrance-free insect repellents or patches that can be attached/applied to clothing instead of directly on the skin</li> <li>• Avoid scratching on the site of insect bites</li> <li>• Wear loose-fitting, protective clothing (e.g. long sleeves and pants) outdoors, especially during dawn and dusk</li> </ul>
 <p><b>Pollutants</b>, such as particulate matter, sulphur dioxide and nitrogen dioxide have been shown to increase AD symptoms, through direct skin contact or inhalation.<sup>13</sup></p>	<ul style="list-style-type: none"> <li>• Limiting outdoor activities during high pollution days, including hazy periods e.g. when Pollutant Standards Index (PSI) reaches unhealthy levels</li> </ul>

Triggers	Mitigation strategies (non-exhaustive)
 <p><b>Stress</b> is a common trigger, with patients reporting worse symptoms and more frequent flares during stressful periods.<sup>25</sup> Acute stress enhances itch perception and scratching behaviour, perpetuating the itch–scratch cycle.<sup>26,27</sup></p>	<ul style="list-style-type: none"> <li>• Practise relaxation techniques and mindfulness may reduce perceived itching by lowering stress and anxiety<sup>26</sup></li> <li>• Ensure adequate sleep</li> <li>• Refer to the main ACG (page 5) for managing scratching</li> </ul>
 <p><b>Smoking</b> negatively affects the immune system and the skin's protective barrier may be impacted by oxidative stress from smoke residues.<sup>28</sup></p>	<ul style="list-style-type: none"> <li>• Avoid smoking and exposure to second-hand smoke<sup>21</sup> (Refer to '<a href="#">Promoting smoking cessation and treating tobacco dependence</a>' ACG)</li> </ul>
 <p><b>Chemical irritants</b> in soap and detergents, such as harsh surfactants, high concentration of ethanol, and fragrances, may irritate skin and cause AD flares in some sensitised patients.</p>	<ul style="list-style-type: none"> <li>• Use fragrance-free and hypoallergenic products as they typically contain fewer common irritants and allergens</li> <li>• Test new topical products by applying a small amount to a small area of skin and monitor for any reactions like redness, itching or swelling over the next 48 hours<sup>29</sup></li> </ul>
 <p><b>Food allergy</b> can be a trigger for AD (more commonly in children than adults) and usually involve hen's eggs, cow's milk, soy, peanuts, tree nuts, wheat, fish and shellfish.<sup>30</sup></p>	<ul style="list-style-type: none"> <li>• Base referrals on comprehensive assessment rather than solely on AD presence or suspicious history</li> <li>• Refer to an allergist or dermatologist for formal diagnosis food allergy and provide counseling on appropriate diet</li> <li>• Avoid randomly or blindly eliminating food groups from patients' diets, without confirmed diagnosis of food allergy, as it is not proven to be effective in improving disease course and may cause nutritional deficiency, anxiety about food, higher food costs and promote IgE-mediated food allergy<sup>21,31,32</sup></li> <li>• Although food allergies may be a trigger in children with AD (but rarely in adults), the clinical utility of routine testing is limited by high false positive rates and the need for complex interpretation<sup>31,33,34</sup></li> </ul>
 <p><b>Rough fabrics</b> can worsen AD symptoms. For example, wool can cause mechanical skin irritation, while <b>occlusive textiles</b> like nylon can retain heat and enhance sweating.<sup>35,36</sup> Evidence showing that certain fabrics can improve severity is still limited.<sup>36,37</sup></p>	<ul style="list-style-type: none"> <li>• Avoid coarse fibres or occlusive clothes<sup>21</sup></li> <li>• Wear clothing made of breathable, loose, soft material like cotton or silk</li> <li>• Wash new clothes before wearing to remove manufacturing chemicals and dyes that may irritate sensitive skin</li> </ul>
 <p><b>Skin infection</b> can trigger or worsen AD through the production of superantigens and proteases, which stimulate inflammatory cytokine release, act as allergens and break down the skin's protective barrier.<sup>38</sup></p>	<ul style="list-style-type: none"> <li>• Refer to the main ACG for the section on secondary infection of AD for more details</li> </ul>
 <p><b>Intercurrent illnesses</b> like respiratory tract infection or viral fever can trigger AD flares, by causing an overactivation of the immune system, which produces inflammatory cytokines that increase itching, inflammation, and allergen sensitivity while weakening the skin's protective barrier.<sup>10</sup></p>	<ul style="list-style-type: none"> <li>• Seek appropriate medical treatment for infections and illnesses</li> <li>• Monitor for early signs of AD flares during illness to allow for early intervention before AD symptoms worsen</li> </ul>

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