Medical Drug Clinical Criteria

Subject:	Dupixent (dupilumab)		
Document #:	CC-0029	**Publish Date:**	07/01/2025
Status:	Revised	**Last Review Date:**	05/16/2025

Table of Contents

Overview

This document addresses the use of Dupixent (dupilumab). Dupixent, an interleukin-4 (IL-4)/interleukin 13 (IL-13) inhibitor, is approved in individuals for the treatment of moderate to severe atopic dermatitis (AD) when disease is not adequately controlled with topical prescription therapies or when those therapies are not advisable. It is also approved for treatment of moderate to severe asthma in individuals with an eosinophilic phenotype or with oral corticosteroid dependent asthma. IL-4 and IL-13 are thought to be major drivers in atopic dermatitis and asthma. Additionally, Dupixent is approved for add-on maintenance treatment in adult patients with inadequately controlled chronic rhinosinusitis with nasal polyposis (CRSwNP). The dose of Dupixent for AD is an initial dose of 600 mg (two 300 mg injections) followed by 300 mg given every other week. The dose of Dupixent for asthma is an initial dose of 400 mg or 600 mg followed by 200 mg or 300 mg every other week. The recommended dose for CRSwNP is 300mg every other week.

Per the American Academy of Dermatology (AAD 2014) AD, the most common form of eczema, affects approximately 2% to 3% of adults and 25% of children. AD is frequently associated with a personal or family history of allergies, allergic rhinitis and asthma. AD typically follows a relapsing/chronic course but often resolves by adulthood. Symptoms can include erythema, edema, xerosis, excoriations, pruritus, oozing and crusting, or lichenification. While there is no accepted standardized method of classifying disease severity, categorization is usually based upon objective disease features, extent of skin involvement and possibly subjective disease features. Due to the impaired skin integrity, affected individuals are more susceptible to skin infections.
In 2023, the American Academy of Dermatology (AAD) published updated guidelines for the treatment of atopic dermatitis with topical therapies. The guidelines state that “Despite advances in systemic therapy for AD, topical therapies remain the mainstay of treatment due to their proven track record and generally favorable safety profile.” Topical calcineurin inhibitors (TCIs), topical corticosteroids (TCS), crisaborole (Eucrisa), and ruxolitinib (Opzelura) are currently supported as acceptable treatments for AD. In 2024, AAD published treatment guidelines for the treatment of AD with systemic therapies. The academy recommended the use of dupilumab (Dupixent), tralokinumab (Adbry), baricitinib (Olumiant), abrocitinib (Cibinqo), and upadacitinib (Rinvoq). There are also recommendations for phototherapy, cyclosporine, methotrexate, azathioprine, and mycophenolate. Systemic corticosteroids are not recommended.
Dupixent is approved as add-on maintenance treatment for CRSwNP in adults 18 years and older who were previously inadequately controlled. Studies included adults with nasal polyposis currently using intranasal corticosteroids, and who were refractory to surgical intervention or treatment with systemic corticosteroids in the past 2 years, or who were otherwise ineligible/intolerant to systemic corticosteroids. Clinical diagnosis of CRSwNP should be confirmed with objective documentation on imaging or direct visualization, such as anterior rhinoscopy, nasal endoscopy, or computed tomography (CT) according to the American Academy of Otolaryngology – Head and Neck Surgery Foundation (AAO-HNSF 2015). Guidance from AAO-HNSF in the 2015 Adult Sinusitis update also recommends topical nasal steroids for long term treatment of nasal polyps, and if no response is seen, then a trial of oral corticosteroids is reasonable. Practice guidelines developed in 2014 by a joint task force representing the American Academy of Allergy, Asthma, and Immunology (AAAAI), the American College of Allergy, Asthma, and Immunology (ACAAI), and the Joint Council of Allergy, Asthma and Immunology (JCAAI) also strongly recommend use of intranasal corticosteroids and oral steroids in the treatment of CRSwNP as it an inflammatory disease. Other adjunctive therapy, such as nasal saline irrigation, may be beneficial for symptoms in some cases.

On May 20, 2022, Dupixent received an additional FDA approval for eosinophilic esophagitis (EoE). This condition can make swallowing food difficult or painful. It is diagnosed by elevated eosinophils in the esophagus. EoE affects approximately 160,000 people in the United States. Current guidelines from the American Gastroenterological Association (AGA 2020) recommends off-label treatment with topical glucocorticoids, budesonide inhalation or fluticasone inhalation, swallowed by mouth rather than inhaled. Additional treatment options include proton pump inhibitors and dietary modifications.

Dupixent has received an additional FDA approved indication for chronic spontaneous urticaria. International treatment guidelines for the management of urticaria recommends initial treatment with second generation antihistamines. These can be increased 4 times the standard doses if lower doses do not control symptoms (Zuberbier 2022).
Dupixent is FDA approved to treat moderate-to-severe asthma in those 6 months of age and older with an eosinophilic phenotype or with oral corticosteroid dependent asthma. Dupixent was studied in individuals with moderate to severe asthma who were currently utilizing moderate to high dose inhaled corticosteroids (ICS) along with another controller medication and 2 or more exacerbations in

the previous year (Castro 2018) or daily corticosteroids along with high dose ICS and another controller medication and 2 or more exacerbations in the previous year (Rabe 2018). In individuals using ICS plus another controller medication, Dupixent reduced exacerbations in individuals with baseline blood eosinophils ≥ 150 cells/μL (cells per microliter); however, exacerbation rates in individuals with eosinophil counts < 150 cells/μL were similar to placebo. In those using daily oral corticosteroids, Dupixent use achieved greater reductions in daily maintenance oral corticosteroid doses and had fewer exacerbations while maintaining asthma control compared to placebo. The 2022 Global Initiative for Asthma (GINA) issued guidelines for the diagnosis and treatment of difficult-to-treat and severe asthma noting in Step 6b that Dupixent may be an option in those with severe asthma despite high-dose inhaled corticosteroid, long-acting beta adrenergic (ICS-LABA) with or without daily oral corticosteroids. The 2022 GINA does not suggest the use of Dupixent in individuals with current or historic blood eosinophil counts >1500 cells/microliter.

Comparative doses for Inhaled Corticosteroids (ICS) (Adults and Adolescents) (Wenzel 2021)

Drug	Low Daily Dose	Medium Daily Dose	High Daily Dose
Beclomethasone 40 or 80 mcg/actuation	80-160 mcg	>160-320 mcg	>320-640 mcg
Budesonide 90 or 180 mcg/actuation	180-360 mcg	>360–720 mcg	>720-1440 mcg
Ciclesonide 80 or 160 mcg/actuation	160 mcg	320 mcg	640 mcg
Flunisolide 80 mcg/dose	176–220 mcg 100-250 mcg	>220–440 mcg >250–500 mcg	>440-1760 mcg >500-2000 mcg
Fluticasone propionate MDI: 44, 110 or 220 mcg/actuation DPI: 50, 100 or 250 mcg/dose	50 mcg	100 mcg	200 mcg
Fluticasone furoate 50, 100 or 200 mcg/dose	200 mcg 220 mcg	>200-400 mcg >220-440 mcg	>400-800 mcg >440-880 mcg
Mometasone MDI: 50, 100 or 200 mcg/actuation DPI: 110 or 220 mcg/actuation	80-160 mcg	>160-320 mcg	>320-640 mcg

DPI = dry powder inhaler; MDI = metered-dose inhaler

Clinical Criteria

When a drug is being reviewed for coverage under a member's medical benefit plan or is otherwise subject to clinical review (including prior authorization), the following criteria will be used to determine whether the drug meets any applicable medical necessity requirements for the intended/prescribed purpose.

Dupixent (Dupilumab)

Initial requests for Dupixent (dupilumab) for the treatment of asthma may be approved if the following criteria are met:

I. Individual is 6 years of age or older; **AND**
II. Individual has a diagnosis of moderate-to-severe asthma as demonstrated by the following (NHLBI 2020):
  A. A pretreatment forced expiratory volume in 1 second (FEV_1) less than or equal to (≤) 80% predicted; **AND**
  B. FEV_1 reversibility of at least 12% and 200 milliliters (ml) after albuterol (salbutamol) administration; **AND**
III. One of the following:
  A. Documentation is provided that individual has a blood eosinophil count (in the absence of other potential causes of eosinophilia, including hypereosinophilic syndromes, neoplastic disease, and known or suspected parasitic infection) greater than or equal to 150 cells/microliter [1 microliter (μL) is equal to 1 cubic millimeter (mm^3)] at initiation of therapy; **AND**
  B. Documentation is provided that individual has had a 3 month trial and inadequate response or intolerance to combination controller therapy (high dose inhaled corticosteroids plus long acting $beta_2$ –agonists, leukotriene modifiers, theophylline or oral corticosteroids) (ERS/ATS 2013, GINA2020);

  OR
  C. Individual has oral corticosteroid dependent asthma; **AND**
  D. Documentation is provided that individual has had a 3 month trial and inadequate response or intolerance to high dose inhaled corticosteroid with daily oral glucocorticoids given in combination with a controller medication (either a long-acting beta2-agonist, **or** leukotriene receptor antagonist, **or** theophylline) (ERS/ATS 2013, GINA2020); **AND**
IV. Individual has experienced two or more asthma exacerbations in the prior 12 months requiring use of a systemic corticosteroid **or** temporary increase in the individual's usual maintenance dosage of oral corticosteroids (Castro 2018, Rabe 2018).

Continuation of therapy with Dupixent (dupilumab) for asthma may be approved if the following criteria are met:

I. Individual has experienced one or more of the following:
   A. Decreased utilization of reliever medications; **OR**
   B. Decreased frequency of exacerbations (defined as worsening of asthma that requires an increase in inhaled corticosteroid dose or treatment with systemic corticosteroids); **OR**
   C. Increase in predicted FEV_1 from pretreatment baseline; **OR**
   D. Reduction in reported asthma-related symptoms, such as, asthmatic symptoms upon awakening, coughing, fatigue, shortness of breath, sleep disturbance, or wheezing; AND
   E. Individual continues to use Dupixent in combination with inhaled corticosteroid-based controller therapy.

Approval Duration for asthma
Initial Requests: 6 months
Continuation Requests: 12 months

Initial requests for Dupixent (dupilumab) for the treatment of Chronic Obstructive Pulmonary Disease (COPD) may be approved if the following criteria are met:

I. Individual has a diagnosis of chronic obstructive pulmonary disease (COPD); **AND**
II. Documentation is provided that individual has a blood eosinophil count of at least 300 per microliter (Bhatt 2023); **AND**
III. COPD diagnosis is demonstrated by post-bronchodilator FEV1/FVC <0.7 (Bhatt 2023, GOLD 2024); **AND**
IV. Individual has moderate to severe airflow obstruction demonstrated by post-bronchodilator FEV1 30-70% predicted normal value (Bhatt 2023); **AND**
V. Individual meets one of the following (Bhatt 2023) (A or B):
   A. At least one (1) hospitalization or more than 24 hours of medical observation related to COPD in the past twelve (12) months; **OR**
   B. In the past twelve (12) months, at least two (2) moderate COPD exacerbations and required systemic steroids for at least one (1) exacerbation; **AND**
VI. Documentation is provided that individual meets one of the following (Bhatt 2023) (A or B):
   A. Individual is on a stable dose of LAMA-LABA therapy including inhaled glucocorticoid; **OR**
   B. Individual is unable to use an inhaled glucocorticoid due to a medical reason and is on a stable dose of LAMA-LABA therapy.

Continuation requests for Dupixent (dupilumab) for Chronic Obstructive Pulmonary Disease (COPD) may be if approved if the following criteria are met:

I. Individual will continue to use Dupixent (dupilumab) in combination with LAMA/LABA therapy OR ICS/LAMA/LABA therapy unless not tolerated; **AND**
II. Treatment with Dupixent has resulted in clinical improvement in one or more of the following:
   A. Decreased utilization of reliever medication; **OR**
   B. Decreased frequency or severity of exacerbations; **OR**
   C. Reduction in reported COPD-related symptoms, including shortness of breath, cough, fatigue or sleep disturbance.

Approval Duration for COPD
Initial Requests: 6 months
Continuation Requests: 12 months

Initial requests for Dupixent (dupilumab) for the treatment of atopic dermatitis may be approved if the following criteria are met:

I. Individual is age 6 months or older; **AND**
II. Individual has a diagnosis of moderate to severe atopic dermatitis; **AND**
III. Documentation is provided that individual has tried one of the following and treatment failed to achieve and maintain remission of low or mild disease activity:
   A. Topical calcineurin inhibitors
   OR
   B. Eucrisa;
   OR
   C. Opzelura;
   OR
   D. Zoryve 0.15% Cream;
   OR
   E. Vtama Cream;
   OR
   F. Phototherapy (UVB or PUVA);
   OR
   G. Non-corticosteroid systemic immunosuppressants (such as cyclosporine, azathioprine, methotrexate, or mycophenolate mofetil);

OR

H. Individual has contraindications to topical calcineurin inhibitors AND Eucrisa AND Opzelura AND Zoryve 0.15% Cream AND Vtama Cream AND Non-corticosteroid systemic immunosuppressants (such as cyclosporine, azathioprine, methotrexate, or mycophenolate mofetil) AND unable to use Phototherapy.

Continuation requests for Dupixent (dupilumab) for atopic dermatitis may be if approved if the following criterion is met:

I. Treatment with Dupixent has resulted in significant improvement or stabilization in clinical signs and symptoms of disease (including but not limited to decrease in affected body surface area, pruritus, or severity of inflammation, and/or improved quality of life).

Initial requests for Dupixent (dupilumab) for the treatment of chronic rhinosinusitis with nasal polyposis (CRSwNP) may be approved if the following criteria are met:

I. Individual is age 12 years and older; **AND**
II. Documentation is provided that individual has a diagnosis of CRSwNP demonstrated on one of the following (AAO-HNSF 2015):
    A. Anterior rhinoscopy; **OR**
    B. Nasal endoscopy; **OR**
    C. Computed tomography (CT);

AND

III. Individual has had recent trial and inadequate response to maintenance intranasal corticosteroids (AAO-HNSF 2015);

AND

IV. Individual has had a trial and inadequate response or intolerance to one of the following agents (A or B) or has contraindications to all of the following agents (both A and B):
    A. Systemic corticosteroids; **OR**
    B. Sino-nasal surgery;

AND

V. Individual is requesting Dupixent (dupilumab) as add-on therapy to maintenance intranasal corticosteroids.

Continuation requests for Dupixent (dupilumab) for chronic rhinosinusitis with nasal polyposis (CRSwNP) may be if approved if the following criterion is met:

I. Treatment with Dupixent has resulted in confirmed clinically significant improvement or stabilization in clinical signs and symptoms of disease (including but not limited to improvement in nasal polyp score or nasal congestion score).

Approval Duration for CRSwNP
Initial Requests: 6 months
Continuation Requests: 12 months

Initial requests for Dupixent (dupilumab) for the treatment of eosinophilic esophagitis (EoE) may be approved if the following criteria are met:

I. Individual is 1 year of age or older and weighs at least 15kg; **AND**
II. Individual has a diagnosis of EoE; **AND**
III. Documentation is provided that individual has15 or more intraepithelial eosinophils per high-power field (eos/hpf) (NCT03633617); **AND**
IV. Documentation is provided that individual has symptoms of dysphagia (NCT03633617); **AND**
V. Individual has tried a course of proton pump inhibitors (PPIs) (Hirano,2020); **AND**
VI. Individual has tried a course of glucocorticoids (including but not limited to fluticasone propionate metered dose inhaler swallowed instead of inhaled, or budesonide inhalation swallowed instead of inhaled) for the treatment of EoE (Hirano, 2020).

Continuation requests for Dupixent (dupilumab) for EoE may be if approved if the following criteria is met:

I. Treatment with Dupixent has resulted in clinically significant improvement or stabilization in clinical signs and symptoms of disease (including but not limited to improvement in symptoms of dysphagia).

Initial requests for Dupixent (dupilumab) for the treatment of Prurigo Nodularis (PN) may be approved if the following criteria are met:

I. Individual has a diagnosis of PN; **AND**
II. Individual has 20 or more PN lesions (NCT04202679); **AND**
III. Documentation is provided that individual has tried one of the following and treatment failed to achieve and maintain remission of low or mild disease activity:
    A. Medium to super-potent topical corticosteroids (NCT04202679);

OR
B. Topical calcineurin inhibitors.

Continuation requests for Dupixent (dupilumab) for PN may be if approved if the following criteria is met:

I. Treatment with Dupixent has resulted in confirmed clinically significant improvement or stabilization in clinical signs and symptoms of disease (including but not limited to improvement of symptoms such as decreased itching, or decreased number or thickness of PN lesions).

Initial requests for Dupixent (dupilumab) for chronic spontaneous urticaria (CSU) may be approved if the following criteria are met:

I. Individual is 12 years of age or older; **AND**
II. Individual has a diagnosis of chronic spontaneous urticaria (CSU); **AND**
III. Individual has had an inadequate response to a two-week trial of a second generation H1 antihistamine up dosed to a maximum of four times the approved dose (Zuberbier 2022).

Continuation requests for Dupixent (dupilumab) for chronic spontaneous urticaria (CSU) may be approved if the following criterion is met:

I. Treatment with Dupixent has resulted in clinically significant improvement or stabilization in clinical signs and symptoms of disease (including but not limited to itch severity and hive count); **AND**
II. Individual continues to use Dupixent in combination with second generation H1 antihistamine therapy.

Dupixent (dupilumab) may not be approved for the following:

I. In combination with oral or topical JAK inhibitors; **OR**
II. In combination with other immunosuppressants (such as cyclosporine, azathioprine, mycophenolate mofetil, or methotrexate); **OR**
III. In combination with ensifentrine, tralokinumab, reslizumab, benralizumab, lebrikizumab-ibkz, nemolizumab-ilto, mepolizumab, tezepelumab, or omalizumab; **OR**
IV. Individual is requesting Dupixent for the treatment of asthma; **AND**
   A. Individual has current blood eosinophils greater than 1500 cells/microliter [1 microliter (µL) is equal to 1 cubic millimeter (mm3)] (GINA 2022); **AND**
   B. Asthma related causes have been excluded (GINA 2022); **OR**
V. Requests for Dupixent (dupilumab) may not be approved when the above criteria are not met and for all other indications.

Quantity Limits

Dupixent (dupilumab) Quantity Limits

Drug	Limit
Dupixent (dupilumab) 100mg/0.67 mL syringe	2 syringes per 28 days
Dupixent (dupilumab) 200 mg/1.14 mL pre-filled syringe/pen *	• 11 years old or younger: 1 syringe/pen every 28 days@^ • 12 years old or older: 2 syringes/pens every 28 days
Dupixent (dupilumab) 300 mg/2 mL pre-filled syringe, 300 mg/2 mL pre-filled pen*	• 11 years old or younger: 1 syringe/pen per 28 days%+ • 12 years old or older: 2 syringes/pens per 28 days#
Override Criteria	
*Initiation of therapy: May approve two additional 200 mg/1.14 mL prefilled syringe OR 300 mg/2 mL pre-filled syringes in the first month of therapy for initiation dose for the indication of atopic dermatitis if the individual is 6 years old or older OR asthma if the individual is 12 years old or older OR prurigo nodularis OR chronic spontaneous urticaria. @For individuals weighing 30kg or more, may approve 2 syringes/pens per 28 days. % For individuals more than 30 kg, may approve 2 syringes/pens per 28 days. ^ In the treatment of eosinophilic esophagitis: May approve 2 syringes/pens per 28 days. # In the treatment of eosinophilic esophagitis: May approve 4 syringes/pens per 28 days. + In the treatment of eosinophilic esophagitis for individuals weighing 40 kg or more: May approve 4 syringes/pens per 28 days.	

Coding

The following codes for treatments and procedures applicable to this document are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement

policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

HCPCS

J3590	Unclassified biologics [when specified as dupilumab (Dupixent) (dupilumab)]
C9399	Unclassified drugs or biologicals [when specified as Dupixent (dupilumab)]

ICD-10 Diagnosis

L20.0-L20.9	Atopic dermatitis
L28.1	Prurigo nodularis
L50.1	Idiopathic urticaria
L50.8	Other urticaria
L50.9	Urticaria, unspecified
J44.0-J44.9	Other chronic obstructive pulmonary disease
J45.40-J45.52	Moderate/severe persistent asthma
J45.901-J45.998	Other and unspecified asthma
J82.83	Eosinophilic asthma
J32.0-J32.9	Chronic sinusitis
J33.0-J33.9	Nasal Polyp
K20.0	Eosinophilic esophagitis

Document History

Revised: 05/16/2025
Document History:

- 05/16/2025 – Select Review: add chronic spontaneous urticaria and quantity limits update. Coding Reviewed: Added ICD-10-CM L50.1, L50.8, L50.9.
- 02/21/2025 – Select Review: Add Vtama to atopic dermatitis criteria, add ensifentrine, Ebglyss, and Nemluvio to do not approve criteria, wording. Administrative update to add documentation. Coding Reviewed: Updated descriptions for HCPCS NOC J3590 and C9399. Added ICD-10-CM J32.0-J32.8 and updated description for J32.0-J32.9.
- 11/15/2024 – Select Review: add new indication for COPD. Coding Reviewed: No changes.
- 10/02/2024 – Select Review: update CRSwNP age. Coding Reviewed: No changes.
- 09/09/2024 – Select Review: update prurigo nodularis criteria to include systemic therapies, remove topical overrides from prurigo nodularis, wording and formatting. Coding Reviewed: No change.
- 08/16/2024 – Annual Review: wording and formatting, update requirements and quantity limit for eosinophilic esophagitis, add Zoryve 0.15% Cream, add approval lengths for asthma and chronic rhinosinusitis with nasal polyposis. Coding Reviewed: Add ICD-10-CM L28.1.
- 03/11/2024 – Select Review: No change. Coding Reviewed: No changes.
- 02/23/2024 – Select Review: update eosinophilic esophagitis age, update asthma continuation criteria, update quantity limits for eosinophilic esophagitis. Coding Reviewed: No changes.
- 08/18/2023 – Annual Review: No changes. Coding Reviewed: No changes. 12/12/2022 – Select Review: update language for CRSwNP, add prurigo nodularis criteria, update quantity limit, wording and formatting. Coding Reviewed: No changes.
- 08/19/2022 – Annual Review: Update atopic dermatitis, add eosinophilic esophagitis criteria, update do not approve criteria, update quantity limits. Coding Reviewed: Added ICD-10-CM K20.0. Added HCPCS C9399. Removed HCPCS J3490.
- 08/01/2022 – administrative update to add documentation.
- 02/25/2022 – Select Review: clarify systemic therapy in atopic dermatitis, update do not approve criteria, wording and formatting changes Coding Reviewed: No changes.
- 12/13/2021 – Select Review: Update age limit on asthma criteria, add new strength. Coding Reviewed: No changes.
- 08/20/2021-Annual Review: Add continuation criteria for nasal polyps and atopic dermatitis. Coding reviewed: No changes.
- 08/01/2021 – Administrative update to add documentation.
- 08/21/2020 – Annual Review: Update asthma criteria to remove medium dose inhaled corticosteroids from requirements per GINA guidance. Update atopic dermatitis criteria to require use of both topical steroids and topical calcineurin

inhibitors, OR use of phototherapy or systemic treatment. Wording, formatting, and reference updates. Administrative update to add drug specific quantity limit. Coding reviewed: No changes. Effective 7/1/21 Added ICD-10-CM J82.83.

- 06/08/2020 – Select Review: Update criteria for atopic dermatitis to expand pediatric use per FDA label. Coding Reviewed: No changes
- 08/16/2019 – Annual Review: Add new FDA indication for chronic rhinosinusitis with nasal polyposis. Update QL override criteria. Update atopic dermatitis criteria to remove requirement for diagnosis present for 3 years. Coding Reviewed: Added ICD-10 codes J32.9, J33.0-J33.9
- 05/17/2019 – Selected Review: Update Dupixent PA to allow for age 12 and older for the diagnosis of atopic dermatitis. Coding Reviewed: No changes
- 10/23/2018 – Selected Review: Updated to add criteria for new asthma indication; added ICD-10 codes for moderate persistent and severe persistent asthma. Updated diagnosis codes: J44.0-J44.9, J45.40-J45.52, J82 due to FDA approved indication for Asthma.
- 08/17/2018 – Annual Review: First review of Dupixent; Annual review. No changes. Review preliminary criteria for Asthma indication. Added diagnoses codes J45.901-J45.998 for other and unspecified asthma.

References

1. Bhatt, Surya P et al. "Dupilumab for COPD with Type 2 Inflammation Indicated by Eosinophil Counts." The New England journal of medicine vol. 389,3 (2023): 205-214. doi:10.1056/NEJMoa2303951.
2. Bhatt, Surya P et al. "Dupilumab for COPD with Blood Eosinophil Evidence of Type 2 Inflammation." The New England journal of medicine vol. 390,24 (2024): 2274-2283. doi:10.1056/NEJMoa2401304.
3. Blauvelt A, de Bruin-Weller M, Gooderham M, et al. Long-term management of moderate-to-severe atopic dermatitis with dupilumab and concomitant topical corticosteroids (LIBERTY AD CHRONOS): a 1-year, randomised, double-blinded, placebo-controlled, phase 3 trial. Lancet. 2017; 389(10086):2287-2303.
4. Castro M, Corren J, Pavord J, et al. Dupilumab efficacy and safety in moderate to severe asthma. *New Engl J Med*. 2018; 378: 2486-96.
5. Chung KF, Wenzel SE, Brozek JL, et.al. International European Respiratory Society/American Thoracic Society guidelines on definition, evaluation and treatment of severe asthma. *Eur Respir J.* 2014; 43(2):343-373.
6. Clinical Pharmacology [database online]. Tampa, FL: Gold Standard, Inc.: 2025. URL: http://www.clinicalpharmacology.com. Updated periodically.
7. DailyMed. Package inserts. U.S. National Library of Medicine, National Institutes of Health website. http://dailymed.nlm.nih.gov/dailymed/about.cfm. Updated periodically.
8. Davis DMR, Drucker AM, Alikhan A, et al. Guidelines of care for the management of atopic dermatitis in adults with phototherapy and systemic therapies. J Am Acad Dermatol. 2024;90(2):e43-e56. doi:10.1016/j.jaad.2023.08.102
9. Diprolene (betamethasone dipropionate lotion). 1983. Revised 5/2019. DailyMed. Package inserts. U.S. National Library of Medicine, National Institutes of Health website. Available at file:///C:/Users/AF38863/Downloads/20190514_dbe069ce-f93e-4f67-bcb2-dfbb932a1f15.pdf. Accessed July 12, 2021.
10. DrugPoints® System [electronic version]. Truven Health Analytics, Greenwood Village, CO. Updated periodically.
11. Eichenfield L. Guidelines of care for the management of atopic dermatitis: section 2. Management and treatment of atopic dermatitis with topical therapies. Journal of the American Academy of Dermatology. 2014-01;71:116.
12. Elidel (pimecrolimus cream). 2001. Revised 12/2017. DailyMed. Package inserts. U.S. National Library of Medicine, National Institutes of Health website. Available at file:///C:/Users/AF38863/Downloads/20191218_e4027e5a-0f9b-4070-b196-f60172f45c4c.pdf. Accessed July 12, 2021.
13. Elmariah, Sarina et al. "Practical approaches for diagnosis and management of prurigo nodularis: United States expert panel consensus." Journal of the American Academy of Dermatology vol. 84,3 (2021): 747-760. doi:10.1016/j.jaad.2020.07.025
14. Global Strategy for the Diagnosis, Management and Prevention of COPD, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2024. Available from: http://goldcopd.org. Accessed on: September 27, 2024.
15. Cloutier MM, Baptist AP, Blake KV, et al; Expert Panel Working Group of the National Heart, Lung, and Blood Institute administered and coordinated National Asthma Education and Prevention Program Coordinating Committee; 2020 focused updates to the asthma management guidelines: a report from the National Asthma Education and Prevention Program Coordinating Committee Expert Panel Working Group [published correction appears in J Allergy Clin Immunol. 2021;147(4):1528–1530]. J Allergy Clin Immunol. 2020;146(6):1217-1270. Available from: https://www.nhlbi.nih.gov/health-topics/asthma-management-guidelines-2020-updates. Accessed June 22, 2022.
16. Global Initiative for Asthma. Global strategy for asthma management and prevention, 2024. Updated May 2024. Available at: https://ginasthma.org/wp-content/uploads/2024/05/GINA-2024-Strategy-Report-24_05_22_WMS.pdf
17. Lexi-Comp ONLINE™ with AHFS™, Hudson, Ohio: Lexi-Comp, Inc.; 2024; Updated periodically.
18. Hirano I, Chan ES, Rank MA, et al. AGA institute and the joint task force on allergy-immunology practice parameters clinical guidelines for the management of eosinophilic esophagitis. Ann Allergy Asthma Immunol. 2020;124(5):416-423. doi:10.1016/j.anai.2020.03.020. Accessed on: June 22, 2022
19. Maurer, Marcus et al. "Dupilumab in patients with chronic spontaneous urticaria (LIBERTY-CSU CUPID): Two randomized, double-blind, placebo-controlled, phase 3 trials." The Journal of allergy and clinical immunology vol. 154,1 (2024): 184-194. doi:10.1016/j.jaci.2024.01.028
20. Rabe KF, Nair P, Brusselle G, et al. Efficacy and safety of dupilumab in glucocorticoid-dependent severe asthma. New Engl J Med. 2018; 378:2475-85.

21. Peters AT, Spector S, Hsu J, et al. Diagnosis and management of rhinosinusitis: a practice parameter update. American College of Allergy, Asthma & Immunology. 2014;113:347-385. Accessed July 12, 2021.
22. Protopic (tacrolimus ointment). 2000. Revised 4/2019. DailyMed. Package inserts. U.S. National Library of Medicine, National Institutes of Health website. Available at file:///C:/Users/AF38863/Downloads/20190501_51218de3-dabc-4972-9c5b-750c8b1d8083.pdf Accessed July 12, 2021.
23. Rosenfeld RM, Piccirillo JF, Chandrasekhar SS, et.al. American Academy of Otolaryngology-Head and Neck Surgery Clinical Practice Guideline (Update): Adult Sinusitis. *Otolaryngology-Head and Neck Surgery.* 2015;152(2S)SI-S39. Accessed July 12, 2021.
24. Sidbury, Robert et al. "Guidelines of care for the management of atopic dermatitis in adults with topical therapies." Journal of the American Academy of Dermatology vol. 89,1 (2023): e1-e20. doi:10.1016/j.jaad.2022.12.029
25. Ständer, Sonja et al. (2020). IFSI-guideline on chronic prurigo including prurigo nodularis. Itch. 5. e42-e42. 10.1097/itx.0000000000000042. Stevens WW, Schleimer RP, Kern RC. Chronic Rhinosinusitis with Nasal Polyps. J Allergy Clin Immunol Pract. 2016;4(4):565-572. doi:10.1016/j.jaip.2016.04.012. Accessed June 22, 2022.
26. Ständer, Sonja et al. IFSI-guideline on chronic prurigo including prurigo nodularis. Itch 5(4):p e42, October-December 2020. | DOI: 10.1097/itx.0000000000000042
27. Study of Dupilumab for the Treatment of Patients With Prurigo Nodularis, Inadequately Controlled on Topical Prescription Therapies or When Those Therapies are Not Advisable (PRIME2). ClinicalTrials.gov identifier: NCT04202679. Updated September 28, 2022. Accessed October 7, 2022. https://clinicaltrials.gov/ct2/show/NCT04202679
28. Study of Dupilumab for the Treatment of Patients With Prurigo Nodularis, Inadequately Controlled on Topical Prescription Therapies or When Those Therapies are Not Advisable (LIBERTY-PN PRIME). ClinicalTrials.gov identifier: NCT04183335. Updated September 28, 2022. Accessed October 7, 2022. https://clinicaltrials.gov/ct2/show/record/NCT04183335
29. Ultravate (halobetasol propionate lotion). 1990. Revised 5/2020. DailyMed. Package inserts. U.S. National Library of Medicine, National Institutes of Health website. Available at file:///C:/Users/AF38863/Downloads/20200509_0d563d44-17fd-4976-9f2c-f1d509f29587.pdf. Accessed July 12, 2021.
30. Wenzel S. Treatment of severe asthma in adolescents and adults. Last updated: October 21, 2022. In: UpToDate, Post TW (Ed), UpToDate, Waltham, MA. Accessed: January 27, 2023.
31. Wenzel S, Castro M, Corren J, et al. Dupilumab efficacy and safety in adults with uncontrolled persistent asthma despite use of medium to high dose inhaled corticosteroids plus a long-acting Beta-2 agonist: a randomized double-blind, placebo-controlled pivotal phase 2b dose-ranging trial. *Lancet*. 2016; 388:31-44.
32. Zuberbier T, Abdul Latiff AH, Abuzakouk M, et al. The international EAACI/GA²LEN/EuroGuiDerm/APAAACI guideline for the definition, classification, diagnosis, and management of urticaria. Allergy. 2022; 77: 734–766. doi:10.1111/all.15090