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Title: Joint American Academy of Dermatology-Hidradenitis Suppurativa Foundation Guidelines of Care for the Management of Hidradenitis Suppurativa

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Disclaimer: Adherence to these guidelines will not ensure successful treatment in every situation. Furthermore, these guidelines should not be interpreted as setting a standard of care or be deemed inclusive of all proper methods of care, nor exclusive of other methods of care reasonably directed to obtaining the same results. The ultimate judgment regarding the propriety of any specific therapy must be made by the physician and the patient in light of all the circumstances presented by the individual patient, and the known variability and biologic behavior of the disease. This guideline reflects the best available data at the time the guideline was prepared. The results of future studies may require revisions to the recommendations in this guideline to reflect new data.

Abstract

Background: Hidradenitis suppurativa affects 0.7-1.5% of the global population and substantially impairs quality of life.

Objective: To provide evidence-based recommendations for the management of hidradenitis suppurativa.

Methods: A work group conducted a systematic review and applied the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) approach to assess the certainty of evidence and to develop recommendations.

Results: This guideline presents 37 evidence-based recommendations. Strong recommendations are made for adalimumab, bimekizumab, infliximab, secukinumab, and routine pain assessment. Conditional recommendations are made for topical clindamycin, resorcinol, and ruxolitinib; oral doxycycline, tetracycline, clindamycin and rifampin, and ertapenem; spironolactone; short-term systemic steroids; upadacitinib; specific procedural interventions; tobacco cessation; supportive pain management; zinc supplementation and vitamin D repletion.

Limitations: Analysis is limited to best evidence available from systematic review.

Conclusions: These guidelines provide evidence-based recommendations for the management of hidradenitis suppurativa.

Abbreviations Used

AE, adverse event
AN, abscess and inflammatory nodule
BID, twice daily
HS, hidradenitis suppurativa
HS-PGA, Hidradenitis Suppurativa Physician Global Assessment
HiSCR, Hidradenitis Suppurativa Clinical Response
I&D, incision and drainage
IHS4, International Hidradenitis Suppurativa Severity Score System
IL, interleukin
IV, intravenous
JAKi, Janus kinase inhibitor
PICC, peripherally inserted central catheter
PO, by mouth
PGA, Physician Global Assessment
QOL, quality of life
RCT, randomized controlled trial
SC, subcutaneously
SAE, serious adverse event
TNF, tumor necrosis factor
VAS, visual analog scale

Scope & Objective

The joint American Academy of Dermatology-Hidradenitis Suppurativa Foundation guidelines provide evidence-based recommendations for the management of hidradenitis suppurativa (HS) in adults and adolescents. These guidelines support individualized, patient-centered HS management and focus on topical therapies, systemic antibiotics, hormone therapy, oral retinoids, biologics, systemic therapies, procedural interventions, supportive management, weight reduction, diet, and complementary and alternative medicines available in the United States.

Methods

A multidisciplinary workgroup developed these guidelines using a systematic evidence review process, which included (i) identifying and prioritizing clinical questions and outcomes (**Table I**), (ii) systematic retrieval and assessment of evidence, and (iii) assessment of the certainty of the evidence and formulation of recommendations using GRADE (Grading of Recommendations, Assessment, Development, and Evaluation) (**Table II**).

Literature searches were conducted for evidence of patient values and preferences, resource use, and feasibility. The workgroup also engaged patient partners to provide input on preferences and values during key stages of the guideline development process. This evidence, along with the effectiveness and safety data, was compiled in GRADE evidence-to-decision frameworks for each clinical question to facilitate recommendation development. For detailed methodology, see **Supplemental Appendix 1**.

Table I. Clinical Questions and Scope. HS: Hidradenitis suppurativa; RCT: randomized controlled trial; US: United States

1. What are the efficacy and safety of topical agents for the treatment of HS?	
2. What are the efficacy and safety of systemic non-biologic and non-small molecular inhibitor treatments for HS?	
3. What are the efficacy and safety of biologics and small molecular inhibitors for the treatment of HS?	
4. What are the efficacy and safety of non-surgical or surgical procedural interventions for the treatment of HS?	
5. What are the efficacy and safety of pain management interventions in HS?	
6. What are the efficacy and safety of wound care interventions in HS?	
7. What are the efficacy and safety of dietary interventions for the management of HS?	
8. What are the efficacy and safety of weight reduction interventions for the management of HS?	
9. What are the efficacy and safety of tobacco cessation interventions for the management of HS?	
10. What are the efficacy and safety of complementary and alternative medicine intervention for the management of HS?	
Outcomes of Interest[#]	
Efficacy Outcomes	Change in clinical severity
	Disease progression, regression, or remission
	Cosmetic outcome
Safety Outcomes	Serious adverse events
	Withdrawal due to adverse events
	Other intervention/procedure-specific adverse events or complications of interest
	Change in patient-reported signs/symptoms (pain, itch, drainage, odor, fatigue, etc.)

Patient-Reported Outcomes	Change in quality of life	
	Patient global assessment of disease	
	Change in psychological distress/functioning	
	Change in physical functioning	
Scope		
Characteristic	**Inclusion Criteria**	**Exclusion Criteria**
Population	Adults, adolescents, and preadolescents (≥ 9 years) with a clinical diagnosis of hidradenitis suppurativa	Differential diagnoses outside of this guideline's scope: abscess, acne vulgaris, acne conglobata, cellulitis, folliculitis, furunculosis, infectious abscesses, granuloma inguinale, pilonidal cysts, lymphogranuloma venereum, cutaneous tuberculosis, cutaneous Crohn's disease; Children younger than 9 years old
Intervention	Medical interventions available and approved for use (for any indication) in the US Dietary, weight reduction, and alternative medicine interventions accessible in the US	Treatments not available or approved for use (for any indication) in the US
Study Design^	Published RCTs in which study participants are investigated (inter-individual, parallel-arm trials) Non-randomized studies of interventions	Unpublished research, narrative reviews, studies with a sample <5

Prioritized outcomes varied by research question. See supplemental appendix 1 for detailed outcome description.

^See supplemental Appendix 1 for a complete description of study design inclusion and exclusion criteria

Table II. Strength of Recommendation and Certainty of Evidence

Strength of Recommendation	**Wording**	**Implication**[1-3]
Strong recommendation *for* the use of an intervention	"We recommend…"	Benefits clearly outweigh risks and burdens; recommendation applies to most patients in most circumstances.
Strong recommendation *against* the use of an intervention	"We recommend against…"	Risk and burden clearly outweigh benefits; the recommendation applies to most patients in most circumstances.
Good Practice Statement	"We recommend…"	Guidance was viewed by the Work Group as imperative to clinical practice and developed when the supporting evidence was considerable but indirect, and the certainty surrounding an intervention's impact was high with the benefits clearly outweighing the harms (or vice versa). Good Practice Statements are strong recommendations as the certainty surrounding the impact of the recommended intervention is high. Implementation of these strong recommendations is considered to clearly result in beneficial outcomes.[3]
Conditional recommendation *for* the use of an intervention	"We conditionally recommend…"	Benefits are closely balanced with risks and burdens; recommendation applies to most patients, but the most appropriate action may differ depending on the patient or other stakeholder values.
Conditional recommendation *against* the use of an intervention	"We conditionally recommend against…"	Risks and burden closely balanced with benefits; recommendation applies to most patients, but the most appropriate action may differ depending on the patient or other stakeholder values
Certainty of Evidence	**Wording**	**Implication**[1, 2]
High	"high certainty evidence"	Very confident that the true effect lies close to that of the estimate of the effect.
Moderate	"moderate certainty evidence"	Moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low	"low certainty evidence"	Confidence in the effect estimate is limited; the true effect may be substantially different from the estimate of the effect
Very Low	"very low certainty evidence"	The estimate of effect is very uncertain; the true effect may be substantially different from the estimate of effect

Definition

HS is a chronic, relapsing inflammatory skin disease characterized by recurrent painful nodules, abscesses, and tunnels primarily involving intertriginous skin folds.[4] HS lesions are commonly classified as papules, pustules, nodules, plaques, ulcers, abscesses, comedones, and tunnels,[5] as well as cysts, granulating growths, and ropelike scars.[6] Tunnels are the preferred term over sinus tracts or fistulas, which require imaging confirmation.[5] HS severity constructs and clinician- and patient-reported outcome measures have been variably used across research and clinical contexts.[7] International consensus efforts have encouraged standardization and defined core outcome sets to

evaluate HS treatments and surgeries.[6, 8-10] HS research-specific measures are not feasible or specifically validated for routine clinical use. This workgroup synthesized evidence and developed recommendations based on available data using definitions in literature. HS recommendations specific to moderate to severe HS should not be interpreted as requirements for documenting HS severity using specific measures before patients should access HS treatments.

Recommendations

Recommendations for HS management are listed in **Tables III & IV and Figure 1**. Effective HS management addresses both chronic HS disease and acute HS flares, often requiring multimodal strategies including systemic, procedural, and supportive therapies to control HS symptoms and improve quality of life. Step therapy, an insurance requirement that patients complete a sequence of insurer-designated treatments before coverage is approved for a physician-prescribed therapy, is not evidence-based and creates barriers to effective treatment access. Interdisciplinary HS management should screen for and address medical and psychiatric comorbidities that contribute to HS burden.[11-13]

Table III. Recommendations for the management of hidradenitis suppurativa.
DMARD, disease-modifying anti-rheumatic drugs; HS, hidradenitis suppurativa; TNF, tumor necrosis factor

Recommendation	Strength	Certainty of Evidence	Evidence
Topical therapies			
For patients with HS, we conditionally recommend topical clindamycin.	Conditional	Low	14-19
For patients with HS, we conditionally recommend topical resorcinol.	Conditional	Low	19-25
For patients with HS, we conditionally recommend topical ruxolitinib.	Conditional	Low	26-28
Systemic antibiotics			
For patients with HS, we conditionally recommend doxycycline.	Conditional	Very Low	29, 30
For patients with HS, we conditionally recommend tetracycline.	Conditional	Very Low	17, 31, 32
For patients with HS, we conditionally recommend clindamycin and rifampin.	Conditional	Very Low	33-41
For patients with moderate to severe HS, we conditionally recommend ertapenem.	Conditional	Very Low	42-45
Hormone therapy			
For patients with HS, we conditionally recommend spironolactone.	Conditional	Very Low	46-50
Oral retinoids			
For patients with HS, we conditionally recommend ***against*** acitretin.	Conditional	Very Low	51-55

For patients with HS, we conditionally recommend ***against*** isotretinoin.	Conditional	Very Low	[56]
Biologics			
For patients with moderate to severe HS, we recommend adalimumab.	Strong	Moderate	[57-63]
For patients with moderate to severe HS receiving adalimumab and undergoing surgery, we conditionally recommend continuing adalimumab.	Conditional	Low	[64]
For patients with moderate to severe HS, we recommend bimekizumab.	Strong	Moderate	[58, 65]
For patients with moderate to severe HS, we recommend infliximab.	Strong	Low	[66-75]
For patients with moderate to severe HS, we recommend secukinumab.	Strong	Moderate	[76]
For patients with HS, we conditionally recommend ***against*** etanercept.	Conditional	Very Low	[77-81]
For patients with HS, we conditionally recommend ***against*** guselkumab.	Conditional	Low	[82]
For patients with HS, we conditionally recommend ***against*** risankizumab.	Conditional	Low	[83]
For patients with HS, we conditionally recommend ***against*** vilobelimab.	Conditional	Low	[84]
Systemic therapies (DMARD, small molecule inhibitors, systemic steroids)			
For patients with moderate to severe HS we conditionally recommend upadacitinib.	Conditional	Low	[85]
For patients with moderate to severe HS, we conditionally recommend short-term systemic steroids.	Conditional	Very Low	[86-88]
For patients with HS, we conditionally recommend ***against*** methotrexate as active therapy. <u>Remark:</u> Methotrexate may be used to prevent anti-drug antibodies in patients receiving TNF inhibitors.	Conditional	Very Low	[89]
For patients with HS, we conditionally recommend ***against*** azathioprine as active therapy. <u>Remark:</u> Azathioprine may be used to prevent anti-drug antibodies in patients receiving TNF inhibitors.	Conditional	Very Low	[90, 91]
For patients with HS, we conditionally recommend ***against*** avacopan.	Conditional	Low	[92]
Procedural Interventions			
For patients with HS, we conditionally recommend deroofing to treat recurrent or persistently symptomatic lesions.	Conditional	Very Low	[93-101]
For patients with HS, we conditionally recommend incision & drainage to treat acutely painful abscesses.	Conditional	Very Low	[101-103]
For patients with HS with persistent or recurrent symptomatic lesions, we conditionally recommend lesional or regional excision.	Conditional	Very Low	[100, 104-165]
For patients with HS, we conditionally recommend laser hair removal.	Conditional	Very Low	[166-170]
For patients with HS, we conditionally recommend botulinum toxin.	Conditional	Very Low	[171, 172]
For patients with HS, we conditionally recommend intralesional triamcinolone to treat acutely painful lesions.	Conditional	Very Low	[173-182]

For patients with HS on systemic antibiotic therapy, we conditionally recommend adjunctive hyperbaric oxygen therapy.	Conditional	Very Low	
For pediatric and adolescent patients with HS, we recommend ***against*** radiotherapy for the management of HS.	Good Practice Statement		
Supportive Management			
Clinicians should routinely ask patients with HS about pain as part of clinical assessment.	Good Practice Statement		
For patients with HS, we conditionally recommend supportive pain management in combination with disease-directed therapy. Remark: Clinicians may consider HS pain chronicity, character, and severity when selecting analgesics for pain.	Conditional	Very Low	183, 184
For patients with HS, we conditionally recommend tobacco cessation to improve response to disease-directed therapies.	Conditional	Very Low	185-199
Complementary and Alternative Medicine			
For patients with HS, we conditionally recommend adjunctive oral zinc supplement under clinician guidance.	Conditional	Very Low	200-202
For patients with HS and vitamin D deficiency or insufficiency, we conditionally recommend vitamin D repletion under clinician guidance.	Conditional	Very Low	203, 204

Figure 1. Treatment algorithm for adolescents and adults with hidradenitis suppurativa. *HS,* hidradenitis suppurativa; *CAM*, complementary or alternative medicine

****See PDF**

Topical Therapies

Topical Clindamycin. We conditionally recommend topical clindamycin for HS based on low certainty evidence (**Supplemental Tables 1-5**). Five randomized controlled trials (RCT) including a total of 204 participants, with three comparing topical clindamycin 1% to placebo,[14] no treatment,[19] and oral tetracycline,[17] respectively, and two comparing topical clindamycin monotherapy to combination with benzoyl peroxide[15] or energy-based therapy[18] were identified. Topical clindamycin significantly reduced mean abscesses, inflammatory nodules, and pustules from baseline to week 12 (from 1.15, 1.43, 8.9, respectively, to 0.46, 0.14, 0.38, $p<0.01$) versus placebo (from 1.14, 1.46, 9.9 to 1.50, 0.77, 18.0).[14] Reported adverse events (AE) were fewer with topical clindamycin than placebo and AEs leading to discontinuation were uncommon.[14, 18, 19]

Topical Resorcinol. We conditionally recommend topical resorcinol for HS based on low certainty evidence (**Supplemental Tables 6-7**). One RCT comparing topical resorcinol 10% cream twice daily (BID) to placebo in 40 participants[19] and 5 case series of topical resorcinol 15% applied daily or BID totaling 229 patients[21-25] were identified. Topical resorcinol reduced mean International Hidradenitis Suppurativa Severity Score System (IHS4) score (from 5.65 to 2.5) and improved quality of life (mean Dermatology Quality of

Life score from 9.6 to 4.8) at 24 weeks.[19] Common AEs included desquamation (64-100%), discoloration (33-41%), and mild irritation (34%).[23, 25] AEs requiring discontinuation were not noted.[19, 21]

Topical Ruxolitinib. We conditionally recommend topical ruxolitinib for HS based on low certainty evidence (**Supplemental Tables 8-9**). One Phase 2 RCT comparing topical ruxolitinib 1.5% cream twice daily to vehicle in 69 participants,[26] and a pilot open-label trial with 6 participants[27] were identified. The topical ruxolitinib group was more likely to achieve HiSCR (Hidradenitis Suppurativa Clinical Response)-50, or ≥50% improvement in abscess and nodule count without new abscess or tunnel development, than vehicle group at 16 weeks (79% vs. 50%).[28] No change in mean pain or IHS4 scores at 16 weeks were noted.[28] Common AEs reported included nasopharyngitis (8%).[28]

Systemic Antibiotics

Doxycycline. We conditionally recommend doxycycline for HS based on very low certainty evidence (**Supplemental Tables 10-11**). Despite extensive use of doxycycline for HS, only one RCT comparing modified-release oral doxycycline 40mg daily to regular-release oral doxycycline 100mg BID in 49 participants and one RCT comparing oral doxycycline 100 mg daily monotherapy to combination therapy with metformin were identified.[29, 30] HiSCR was achieved in 64% and 60% with modified-release and regular-release doxycycline, respectively, with no difference noted between formulations.[29] Mean IHS4 and quality of life score improved in both formulations.[29] HiSCR-50 was achieved by 41% of patients on doxycycline monotherapy.[30] AE reported included gastrointestinal (GI) symptoms, transaminitis, and photosensitivity.[29]

Tetracycline. We conditionally recommend tetracycline for HS based on very low certainty evidence (**Supplemental Tables 12-13**). One RCT comparing oral tetracycline 500mg BID with topical clindamycin 1% lotion in 46 participants was identified, with no significant differences noted in Physician Global Assessment (PGA) (mean difference [MD], 5; 95% confidence interval [CI], -14 – 24) or visual analog scale (VAS)-100 pain scores (MD, 2; 95% CI -47 – 51) at 16 weeks.[17] In a prospective cohort comparing tetracycline, doxycycline, and lymecycline in 108 patients, patients receiving tetracycline (n=32) had the highest numerical improvement in mean change Sartorius score (-9.9; 95% CI, -3.0 – -16.9), but no significant difference was demonstrated across treatment groups.[32] AEs reported include GI symptoms, skin irritation and photosensitivity.[32]

Clindamycin in combination with Rifampin. We conditionally recommend clindamycin in combination with rifampin combination therapy for HS based on very low certainty evidence (**Supplemental Tables 14-15**). Eight cohort studies and case series using clindamycin 300mg BID to 600mg daily and rifampin 300mg BID to 600mg daily in 392 patients, and one active comparator RCT were identified.[33-41] Mean Sartorius scores reduced by 46-53% at 10 weeks in 159 patients.[33, 34, 36] HiSCR-50 was achieved in 48% of 83 patients at 12 weeks.[39] AEs reported included GI symptoms[33-36] and 4-26% discontinued treatment due to AE.[35, 36, 38-40] Rifampin is a potent inducer of cytochrome P450 enzymes, especially CYP3A4; drug-drug interactions should be examined. Oral clindamycin monotherapy versus clindamycin plus rifampin combination therapy showed no differences in IHS4 scores at 8 weeks in 60 patients.[205] Prospective studies are needed on clindamycin monotherapy for HS.

Ertapenem. We conditionally recommend ertapenem for moderate to severe HS based on very low certainty evidence (**Supplemental Table 16**). Four cohort studies and case series on ertapenem administered intravenously via peripherally inserted central catheter (PICC) and intramuscularly including a total of 179 patients were identified.[42-45] Median Sartorius score (from 49.5 to 19.0),[43] IHS4 score(28 to 18)[45], and VAS-10 pain score (9 to 2 and 6 to 0)[43, 45] decreased at 6 weeks. Mean HS-PGA (3.9 to 2.7) and pain NRS (4.2 to 1.8) scores decreased after 12-16 weeks of intravenous ertapenem 1g daily.[44] AE included PICC-line thrombosis and infections, dermatitis from PICC adhesives, diarrhea, vaginal candidiasis and vaginitis, transaminitis, infusion reaction, and *C. difficile* colitis.[42-44] Institutional requirements for infectious diseases specialist approval, IV access, potential complications, home nursing care for daily infusions, and limitations to patient activities may limit treatment access. Ertapenem should be reserved for moderate to severe HS, typically refractory to other treatments, and be used as a bridge to more definitive, long-term therapy to steward antibiotic use.

There is insufficient evidence on oral clindamycin monotherapy;[206, 207] dapsone;[208-211] ofloxacin plus clindamycin[212]; metronidazole, rifampin, plus moxifloxacin;[213, 214] and intravenous dalbavacin[215] for HS (**Supplemental Tables 17-24**).

Hormonal Therapies

Spironolactone. We conditionally recommend spironolactone for HS based on very low certainty evidence (**Supplemental Table 25**). Five case series on spironolactone in 323 female patients, most of whom received concomitant therapies, were identified.[46-50] Median spironolactone dose was 100mg daily.[46, 48-50] Mean HS-PGA score decreased by 0.6 after a mean follow up of 7 months.[47] AEs reported included gastrointestinal symptoms,

breast tenderness, changes in urination, irregular bleeding, dizziness, and mental confusion.[47-50] Potential AE include gynecomastia and teratogenicity.

Metformin. There is insufficient evidence on metformin for HS (**Supplemental Tables 11& 26**). One RCT comparing doxycycline 100mg daily as monotherapy or combined with metformin 500mg-1500mg daily did not show significant effects of metformin on IHS4 scores or HiSCR-50 at 24 weeks.[30] Three case series on metformin in 94 patients noted subjective clinical response in 68%, but the data were prone to substantial risks of bias due to small sample size, lack of control groups, and heterogenous outcome measures.[216-218] Long-term effects of metformin on HS-associated cardiometabolic outcomes should be examined.

Oral Retinoids

Acitretin. We conditionally recommend against acitretin for HS based on very low certainty evidence (**Supplemental Table 27**). Five case series on acitretin in 120 patients were identified.[51-55] Outcomes across studies varied with no significant differences shown in HS outcomes compared to baseline, and high rates of patient discontinuation (47-53%) due to ineffectiveness, worsening visual acuity, and severe retinoid dermatitis.[52, 54] Potential risks include teratogenicity, hepatotoxicity, and hyperlipidemia.

Isotretinoin. We conditionally recommend against isotretinoin for HS based on very low certainty evidence (**Supplemental Table 28**). One case series of 68 patients on isotretinoin monotherapy was identified, with 24% reporting visual clearance of disease (per a 0 to 3 scale with 0 indicating no change and 3 visual clearance) at 4 months and high rates of discontinuation (29%) before 4 months due to side effects (15%), poor response (21%), and loss of motivation (4%).[56] Potential risks include teratogenicity, hepatotoxicity, and hyperlipidemia. iPLEDGE requirements may limit access to this treatment.

Subsets of patients with HS and follicular occlusion syndrome may benefit from acitretin or isotretinoin; their outcomes should be further examined.

Biologics

Adalimumab. We recommend adalimumab for moderate-to-severe HS based on moderate certainty evidence (**Supplemental Tables 29-31**). Seven RCT comparing adalimumab 40mg SC weekly after initial loading doses with placebo in 733 patients were identified.[57-63] At week 12, HiSCR50 (≥50% improvement in abscess and nodule count without new abscess or tunnel development) was achieved by more participants on adalimumab 40mg weekly than placebo (Risk Ratio [RR] 1.92; 95%CI 1.57, 2.36).[58, 62]

NRS30, or pain reduction by 30% and ≥1 point on the NRS, favored adalimumab 40mg weekly over placebo (RR 1.58 95%CI, 0.82, 3.06), though the difference was not significant.[62] Mean DLQI improvement was greater in adalimumab 40mg SC weekly than placebo (-2.82 95%CI, -3.69, -1.96).[59, 62] Adalimumab 40mg SC Q2W did not meet efficacy endpoints.[59, 62, 219] Adalimumab 80mg Q2W is an alternative FDA-approved maintenance dose to adalimumab 40mg weekly and may improve patient adherence. In an open-label extension study, HiSCR50 was achieved in 52% of patients maintained on adalimumab 40mg weekly at 3 years.[220]

Common AEs noted in RCT include upper respiratory tract infection (URI), sinusitis, GI symptoms, headache, rash, and injection site reactions. Potential SAE may include serious infections, such as latent tuberculosis reactivation, invasive fungal, bacterial, viral, and other opportunistic infections, and malignancies including lymphoma, though these events were not reported in the Phase 3 PIONEER clinical trials. Risks of SAE and AE leading to discontinuation did not differ between adalimumab and placebo at week 12 in RCT.[59, 62]

Continuation of Adalimumab in Perioperative Period. We conditionally recommend continuing adalimumab in the perioperative period for patients with moderate-to-severe HS receiving adalimumab and undergoing surgery based on low certainty evidence (**Supplemental Table 32**). One RCT compared adalimumab 40mg weekly with placebo in conjunction with axillary or inguinal wide excision for HS followed by secondary intention healing.[64] HiSCR-50 was achieved in more participants on adalimumab than placebo at week 12, while postoperative wound infection, complication, or hemorrhage did not differ between treatment groups, suggesting continuing adalimumab treatment in the perioperative period is safe.[64]

Bimekizumab. We recommend bimekizumab for moderate to severe HS based on moderate certainty evidence (**Supplemental Tables 33-34**). Three RCTs comparing bimekizumab 320mg SC Q2W or Q4W with placebo in 784 participants were identified.[58, 65] At week 16, HiSCR50 and HiSCR75 (≥75% improvement in abscess and nodule count without new abscess or tunnel development) were achieved in more participants on bimekizumab 320mg Q2W than those on placebo (RR, 1.67; 95% CI, 1.31-2.13 and RR, 2.14;1.49-3.06, respectively).[58, 65] Mean DLQI improvement was greater with bimekizumab than placebo at week 16 (RR -1.89; -3.06 – -0.72).[65] At week 48, HiSCR50 and HiSCR75 were achieved in 77-82% and 56-71% of participants maintained on bimekizumab Q4W, and in 66-78% and 57-67% of those maintained on bimekizumab Q2W, respectively.[50,58]

Common AEs noted in RCTs included URI, oral and vulvovaginal candidiasis, headache, injection site reaction, and tinea infection. Serious adverse events included suicidal ideation and behaviors, serious infections, inflammatory bowel disease, and transaminitis. Risks of SAE and AE leading to discontinuation at week 16 did not differ between bimekizumab and placebo.[58, 65]

Infliximab. We recommend infliximab for moderate to severe HS based on low certainty evidence (**Supplemental Tables 35-36**). One RCT comparing infliximab IV 5mg/kg with placebo in 33 participants was identified.[66] Infliximab was more likely to achieve excellent outcome based on PGA at week 8 than placebo (RR, 4.80; 95% CI, 1.66-13.90).[66] HS Severity Index score reduction by 50% favored infliximab over placebo (RR, 4.80; 95% CI, 0.60-38.48) though the difference was not significant.[66] Infliximab decreased mean pain VAS-100 substantially more than placebo (-39.8 vs -0.6).[66] Seven cohort studies of infliximab in 132 patients were also identified.[67-73] Infliximab IV 7.5mg/kg at weeks 0, 2, and 6, followed by IV 7.5-10mg/kg every 4 weeks, with concomitant topical and oral antibiotics and anti-androgen therapy, showed a 2-point reduction in HS-PGA to 0-2 in 71% of patients and decreased mean pain VAS-10 from 5.7 to 0.5 at week 12.[71] Common AEs reported included non-serious infections and infusion reaction.[74] SAE rates were low; potential SAE may include serious infections, such as latent tuberculosis reactivation, invasive fungal, bacterial, viral, and other opportunistic infections, and malignancies including lymphoma.

The workgroup noted clinical experience with infliximab efficacy at higher doses and frequency despite limited supporting literature.[71, 75] The most favorable clinical outcomes were reported in studies that used high-dose, high-frequency infliximab (10 mg/kg every 4 weeks).[71, 75] While IV infusion requirements may limit outpatient access, infliximab remains accessible in publicly funded health systems and may be covered under special drug programs for rare or severe conditions. Given the current unmet needs in patients with treatment-refractory HS, large desirable effects noted across multiple outcomes with infliximab, low potential risks, and patient values likely favoring treatment, we recommend infliximab for moderate to severe HS despite low certainty evidence.

Secukinumab. We recommend secukinumab for moderate to severe HS based on moderate certainty evidence (**Supplemental Tables 37-39**). Two RCTs comparing secukinumab 300mg SC weekly for 5 doses followed by 300mg Q2W or Q4W to placebo in 724 participants were identified.[76] At week 16, HiSCR-50 was achieved in more participants on secukinumab than placebo (RR, 1.35; 95% CI, 1.11-1.63 for Q2W and 1.35; 1.12-1.63 for Q4W), as was HiSCR75 (1.58; 1.16-2.16 for Q2W and 1.69; 1.25-2.30 for Q4W).[76] Pain reduction by 30% on the Numeric Rating Scale (NRS) was more common in secukinumab

than placebo (RR, 1.58; 95% CI, 1.20-2.08 for Q2W and 1.44; 1.08-1.92 for Q4W).[76] DLQI improvement by ≥5 points was more common in secukinumab than placebo (RR, 1.40; 95% CI, 1.01-1.94 for Q2W and 1.57; 1.26-1.95 for Q4W).[76] HiSCR-50 was maintained at week 52 in 76% and 81% of participants on secukinumab Q2W and Q4W who achieved HiSCR-50 at week 16.[76] In participants who switched from placebo to secukinumab at week 16, HiSCR-50 was achieved in 48–55% of patients on secukinumab Q2W and 51–55% on secukinumab Q4W at week 52.[76] In an open-label extension study, patients who continued secukinumab Q2W or Q4W after week 52 had numerically longer median times to an increase in abscesses or nodules than those who switched to placebo. However, neither secukinumab maintenance regimens met the primary endpoint of significantly reducing the risk of an increase in abscesses or nodules over placebo through week 104.[221]

Common AEs noted in HS RCTs included headache, URI, fungal infections, and hypersensitivity. Potential AEs may include serious infections, such as latent tuberculosis reactivation, invasive fungal, bacterial, viral, and other opportunistic infections, and malignancies including lymphoma, inflammatory bowel disease, and severe eczema. Risks of SAE and AE leading to discontinuation did not differ between secukinumab and placebo by week 16.[76]

Etanercept. We conditionally recommend against etanercept for moderate to severe HS based on very low certainty evidence (**Supplemental Tables 40-41**). One RCT compared etanercept with placebo in 17 participants, reporting no difference in PGA or pain at weeks 12 and 24.[77] Three open-label trials of etanercept in 31 participants showed HS improvement but the study designs were prone to substantial risks of bias.[78-81] AEs were uncommon.

Guselkumab. We conditionally recommend against guselkumab for moderate-to-severe HS based on low certainty evidence (**Supplemental Table 42**). One RCT compared guselkumab 400mg SC Q4W and 1,200 IV Q4W regimens with placebo in 121 participants, reporting no significant differences in achieving HiSCR-50 or reducing DLQI to 0 or 1 at 16 weeks.[82] AEs were uncommon.

Risankizumab. We conditionally recommend against risankizumab for moderate to severe HS based on low certainty evidence (**Supplemental Table 43**). One RCT compared risankizumab 180mg and 360mg SC regimens with placebo in 243 participants and showed no significant differences in achieving HiSCR-50 or reducing DLQI to 0 or 1 at 16 weeks.[83] Achieving HiSCR-50 at week 16 with risankizumab may be more common in male

patients and subgroups with higher serum testosterone, lower serum follicle-stimulating hormone, and insulin resistance diagnoses.[222] AEs were uncommon.

Vilobelimab. We conditionally recommend against vilobelimab for HS based on low certainty evidence (**Supplemental Table 44**). A 5-arm RCT comparing subcutaneous vilobelimab 400mg Q4W, 800mg Q2W, 800mg Q4W, and 1200mg Q2W to placebo in 177 participants showed no significant difference in achieving HiSCR-50 at week 16.[84] Vilobelimab reduced secondary endpoints of HS flares and DLQI score but showed no significant differences in modified Sartorius and global assessment scores at week 16.

While individual patients with HS may benefit from select biologics, the conditional recommendations against these biologics aim to guide HS treatment toward higher value options that are more likely to yield desired therapeutic response based on available data.

There was insufficient evidence on the use of anakinra,[223, 224] ixekizumab,[225] spesolimab,[226] and ustekinumab[227-233] for HS (**Supplemental Tables 45-49**).

Systemic Therapies (DMARD, Small Molecule Inhibitors, and Systemic Steroids)

Upadacitinib. We conditionally recommend upadacitinib for moderate to severe HS based on low certainty evidence (**Supplemental Table 50**). One RCT comparing oral upadacitinib 30mg daily and placebo in 68 patients was identified.[85] HiSCR-50 and NRS-30 pain reduction was achieved in more patients receiving upadacitinib compared to historical controls, but did not differ from in-trial placebo group.[85] Reported AEs included headache, dizziness, and urinary tract infection. FDA boxed warnings discuss potential risks of serious infections, malignancy, major adverse cardiovascular events, thrombosis, and higher rates of all-cause mortality; none of these events were reported in the single RCT. An ongoing phase 3 RCT of upadacitinib for HS will inform its efficacy and safety and potentially provide access for on-label prescribing.

Short-term Systemic Corticosteroid. We conditionally recommend short-term systemic steroids for moderate-to-severe HS based on very low certainty evidence (**Supplemental Table 51**). Three case series on oral prednisone or prednisolone in 73 patients were identified.[86-88] Combining prednisone 40mg tapering by 10mg every 3 days with amoxicillin and clavulanic acid BID for 10 days improved patient impression of disease severity, pain score, and mean DLQI score by day 14.[87] HiSCR-50 was achieved in 14 of 20 of adjunctive prednisolone cycles at 0.28-1.0mg/kg for mean 10-90 days in 16 patients.[88] Treatment duration should be limited to minimize risks of long-term systemic corticosteroid use.

Methotrexate. We conditionally recommend against methotrexate as active therapy for moderate to severe HS based on very low certainty evidence (**Supplemental Table 52**). One case series of 15 patients using methotrexate as primary therapy demonstrated nonsignificant reductions in HS-PGA and abscess and inflammatory nodule (AN) counts, while patients receiving concomitant biologic therapy showed no change in disease activity with the initiation of methotrexate.[89] Potential AEs include bone marrow suppression, opportunistic infections, hepatotoxicity, pneumonitis, lymphoma, teratogenicity and fetal death. However, only self-resolving GI disturbances and elevated alkaline phosphate levels that did not interfere with treatment were reported in the included study.

Methotrexate may be used to prevent or manage anti-drug antibody development in patients receiving TNF inhibitors.[234, 235]

Azathioprine. We conditionally recommend against azathioprine as active therapy for moderate to severe HS based on very low certainty evidence (**Supplemental Table 53**). Two case series showed inconsistent results in HS outcomes in 20 patients treated with azathioprine monotherapy.[90, 91] Potential AEs include bone marrow suppression, opportunistic infections, hypersensitivity, lymphoma, and skin cancer. In the included case series, nausea, anemia, abdominal pain, decreased hemoglobin, tiredness, arthralgia, hematuria, hepatic dysfunction, diarrhea, and pancreatitis were reported.

Azathioprine may be used to prevent or manage anti-drug antibody development in patients receiving TNF inhibitors.[234, 236, 237]

Avacopan. We conditionally recommend against avacopan for HS based on low certainty evidence (**Supplemental Tables 54-55**). One RCT comparing avacopan 10mg BID and 30mg BID with placebo in 264 participants reported no difference in HiSCR-50 and NRS-30 between avacopan and placebo at week 12.[92] Fewer AE and SAE were reported in the avacopan than placebo groups.[92]

There is insufficient evidence to make recommendations regarding the use of colchicine,[238-240] cyclosporine,[241] hydroxychloroquine,[242] apremilast,[243-245] and brepocitinib[246] for HS (**Supplemental Tables 56-61**).

Procedural Interventions

Deroofing. We conditionally recommend deroofing to treat recurrent or persistently symptomatic HS lesions based on very low certainty evidence (**Supplemental Table 62**). Nine cohort studies and case series on deroofing in 899 patients were identified.[93-101] HiSCR-50 was achieved in 90% of patients in a prospective cohort of 79 patients treated with deroofing.[97] Mean healing time reported across studies ranged from 4.4 to 10.9 weeks.[95-98] Recurrence occurred in 10%-33% after deroofing, which was comparable to the recurrence after surgical excision.[93, 94, 98, 100, 101] Complications were uncommon (1-2%) and included infection and bleeding.[93, 94, 97, 99]

Incision and Drainage (I&D). We conditionally recommend I&D to treat acutely painful abscesses based on very low certainty evidence (**Supplemental Table 63**). Three case series with 256 patients were identified.[101-103] I&D is perceived positively by patients, led to complete resolution in 26% of cases, but failed to improve HS in 66% of cases.[103] Recurrence rate is higher with I&D than excision and deroofing.[101]

Local and Regional Excision. We conditionally recommend local and regional excision for HS based on very low certainty evidence (**Supplemental Tables 64-69**). Surgical procedures were described by anatomic extent and completeness.[247] Five case series with 317 patients undergoing local excision,[100, 104-107] 3 case series with 77 patients undergoing CO2 laser excision,[158-160] 5 case series with 133 patients undergoing CO2 laser vaporization,[161-163, 165, 248] 33 case series and cohort studies including 1,338 patients undergoing wide excision,[108-136, 150, 152, 154-156] and 17 case series and cohort studies including 627 patients undergoing radical excision[137-149, 151, 153, 157, 249] were identified.

After local excision, complete disease remission was noted in 36-67% and recurrence was noted in 24-63% after 2-3.6 years of follow up.[100, 104-106] Mean healing time ranged in 16-21 days.[104, 107] Complications were reported in 13-30% and included pain, wound infection, bleeding, contractures, and excessive granulation tissue.[104-107] After local excision with CO2 laser, mean healing time ranged from 2-8 weeks, with local recurrence rates of 0-14%.[158-160] Complications included excessive granulation tissue, infection, paresthesia, cellulitis, fever, and wound dehiscence.[158-160] After tissue vaporization with CO2 laser, mean healing time ranged from 3-7 weeks, with local recurrence rate of 0-29%.[158-160] Complications included infection, bleeding, hypertrophic scar, and scar contracture.[158-160] The workgroup collectively considered multiple surgical modalities for local excision in determining this conditional recommendation.

After wide excision, time to healing was highly variable based on closure technique, ranging from 2 weeks to 16 months.[109, 110, 120, 126, 129, 131] Mean hospital length of stay reported

in most studies ranged from 3-13 days.[109, 111, 115, 118-120, 122, 124, 129, 133, 135, 136] Recurrence rates ranged from 0-20% in 16 case series with mean follow up periods of <2 years, [108, 109, 115, 117, 120, 122, 124, 126-129, 131, 134, 135, 150, 152, 154] and 19-70% in 4 case series with mean follow up periods ranging from 3-7.4 years.[111, 119, 123, 130]. Complication rates ranged from 0-56%, and included wound dehiscence, infection, hematoma, flap or graft necrosis or loss, fistula, and deep vein thrombosis. After radical excision, mean hospital length of stay ranged from 4-8.5 days.[140, 143-145, 153] Recurrence rates ranged from 0-47%.[138, 139, 141-149, 151, 153, 249] Complication rates ranged from 0-65%, and included wound dehiscence, infection, hematoma, flap bulkiness, venous congestion, hypertrophic scar, and necrosis.[137, 138, 140-143, 145-149, 151, 153, 249] Given heterogeneity in study reporting and definitions of surgical procedures and disease recurrence, data pertaining to wide and radical excision were collectively considered as regional excision in determining this conditional recommendation.

Laser Hair Removal (LHR). We conditionally recommend LHR for HS based on very low certainty evidence (**Supplemental Tables 70-73**). In one RCT on 755-nm alexandrite LHR, HiSCR-50 was achieved at 24 weeks more often with 4 monthly LHR sessions than no LHR (RR 2.25 95%CI 1.22, 4.15) in 48 patients.[166] In a non-randomized trial on adjunctive alexandrite LHR, HiSCR-50 was achieved at 30 weeks more often with 5 LHR sessions every 6 weeks than no LHR (RR 3.50 95%CI 1.39, 8.80) in 40 patients receiving concurrent topical chlorhexidine and oral zinc gluconate 90mg daily.[167] Patients who received adjunctive alexandrite LHR had fewer disease flares and a lower mean DLQI score.[167] Mean pain NRS during treatment was 6.0.[168] No patients discontinued alexandrite LHR due to AE in trials but 21% reported localized flares in the case series.[166-168]

One RCT comparing LHR with 1,064-nm long-pulsed Nd:YAG to no LHR in 38 patients showed no difference in HiSCR-50 achievement or disease flares at 30 weeks.[169] Mean pain NRS during treatment was 5.4; AEs reported included burning sensation and irritation.[169, 170]

Botulinum Toxin. We conditionally recommend botulinum toxin for HS based on very low certainty evidence (**Supplemental Table 74-75**). One RCT comparing a single session of intradermal botulinum toxin type B (150-600 units per region, maximum 4000 units) to placebo showed decrease in pain VAS 10 (MD -2.7 95%CI -4.6, -0.76) and DLQI (MD -6 95%CI -11.75, -0.25) at 3 months, but no significant differences in inflammatory nodules (MD -3.8 95%CI -9.06, 1.46) or total lesion count (MD -3.3 95%CI -8.91, 2.31).[171] An 8-patient case series of botulinum toxin type A showed pain reduction.[172]

Intralesional triamcinolone. We conditionally recommend intralesional triamcinolone for HS based on very low certainty evidence (**Supplemental Tables 76-77**). One RCT comparing intralesional triamcinolone 10mg/mL or 40mg/mL with placebo showed no difference in pain NRS and time to lesion resolution compared to placebo.[173] Nine cohort studies and case series on intralesional triamcinolone 10-40mg/mL showed decrease in HS severity score, HS-PGA score, pain VAS, pruritus, and DLQI scores at 30 days to 12 weeks.[174-182] Reduction of sinus tract fibrosis was also noted.[175] AEs included skin atrophy, pigmentary changes, yellow depositions, lesion aggravation, acanthosis nigricans, delayed menstrual cycle, fever, glycemic decompensation, and behavioral changes.

Adjunctive Hyperbaric Oxygen Therapy. We conditionally recommend adjunctive hyperbaric oxygen therapy (HBOT) to systemic antibiotics for HS based on very low certainty evidence (**Supplemental Table 24**). One RCT compared adjuvant HBOT to no HBOT in 43 patients receiving clindamycin 300mg BID and rifampicin 300mg BID.[250] HBOT sessions were administered in a hyperbaric chamber 5 days per week for 4 weeks; each session lasted 120 minutes wherein 2.4 atmospheres absolute were administered for 3 periods of 25 minutes.[250] Adjunctive HBOT increased the proportion of patients with ≥50% decrease in HS Severity Index and DLQI scores at weeks 4 and 10.[250] Contraindications to HBOT include heart or lung disease, pneumothorax, pregnancy, upper or lower airway infection, recent surgery, head injury, claustrophobia, or seizures.[250] High cost, travel, and time burdens and limited geographic access to hyperbaric centers may limit HBOT access.

Radiotherapy. There is insufficient evidence to support radiotherapy for HS (**Supplemental Table 78**). Four case series of heterogeneous radiotherapy modalities and doses in 109 patients were identified.[251-254] Small sample sizes and heterogeneous interventions and outcome assessment in these studies with moderate to high risk of bias limited confidence in findings.

While direct evidence on radiotherapy for HS in children is sparse, since radiotherapy poses well-established long-term risks in children and adolescents (e.g., malignancy, infertility, tissue fibrosis, growth abnormalities, endocrine dysfunction) and safer HS treatment options for pediatric patients exist, we recommend against radiotherapy in pediatric and adolescent patients for HS management as a good clinical practice.

There is insufficient evidence for cryotherapy,[255-257] intense pulsed light[258-262], radiofrequency,[18, 258, 259, 263, 264] microwave ablation,[265] photodynamic therapy,[266-269] intralesional photodynamic therapy,[270-274] and sclerotherapy[275] for HS treatment (**Supplemental Tables 79-92**).

Wound Care

There is insufficient evidence to support specific wound care regimens for HS in either usual or post-operative wound care settings (**Supplemental Tables 93-96**). Gentamycin sponge did not significantly reduce post-operative healing time or reduce HS recurrence rate or AE compared to primary closure alone in an RCT of 200 participants.[276] No difference was noted between silver hydrofiber and polyurethane foam, oxygen-enriched olive-oil based dressings, and standard therapy in post-operative wound size and pain score at 4 weeks.[277] Low negative pressure wound therapy reduced pain at post-operative day 7 but did not change physical functioning or healing time as compared to conventional foam dressing in an RCT of 12 patients treated with CO2 laser, and no complications were noted in 8 patients with the use of negative-pressure wound therapy over a synthetic electrospun fiber matrix after radical excision.[278, 279] Further research is needed to determine outcome measures and best practices in usual and post-operative wound care for HS.

Supportive Management

Routine Pain Assessment. We recommend clinicians to routinely ask patients with HS about pain as good clinical practice. Pain is common and often severe and debilitating in patients with HS, with 61% reporting moderate to severe pain.[280] HS-related pain affects physical, mental, and social well-being, yet stigma may limit patient disclosure.[183, 281-284] Routine pain assessment helps clinicians identify unmet needs and guide targeted intervention. Validated tools to assess pain severity include the Numeric Rating Scale, Visual Analog Scale, and Wong-Baker FACES Pain Rating Scale;[285] pain severity and impact may be simultaneously evaluated using the Brief Pain Inventory.[286] The presence and impact of chronic pain may be assessed using the Graded Chronic Pain Scale Revised (GCPS-r).[287] Validated measures to assess pain character include painDETECT for neuropathic pain, Central Sensitization Inventory, and the McGill Pain Questionnaire.[288-294] Regardless of the instrument, clinicians should directly discuss pain with patients to address this often overlooked but burdensome symptom.

Supportive Pain Management. We conditionally recommend supportive pain management in combination with disease-directed therapy for HS based on very low certainty evidence (**Supplemental Tables 97-98**). HS therapies may reduce pain but rarely achieve adequate pain relief.[183] Undertreated pain may result in preventable patient suffering, emergency department visits, unsafe self-care practices, and disengagement from treatment.[281, 295-301] Analgesic selection for HS pain should consider pain chronicity, character (nociceptive, neuropathic, nociplastic), and severity.[183, 302, 303] Acute pain may be managed with warm or cool compresses, topical lidocaine, acetaminophen, non-steroidal

anti-inflammatory drugs, intralesional triamcinolone, incision and drainage, short-term systemic steroids, and opioids only if refractory to other therapies.[183, 302] If opioids are necessary to treat acute pain, clinicians should maximize non-opioid options, discuss realistic benefits and known risks of opioids, and prescribe immediate-release formulations at the lowest effective dose for as needed use and for limited duration.[184] Chronic pain may be managed with serotonin norepinephrine reuptake inhibitors, tricyclic antidepressants, gabapentin, pregabalin, psychotherapy, and wound care optimization.[183] For refractory pain, a multidisciplinary approach involving dermatology, primary care, pain medicine, psychiatry, psychology, palliative care, and wound care should be considered.[303-305]

Tobacco Cessation. We conditionally recommend tobacco cessation to improve response to disease-directed therapy for patients with HS who use tobacco based on very low certainty evidence (**Supplemental Table 99**). Fourteen cohort studies and case series and one survey of 140 patients were identified.[185-199] While associations with HS severity were inconsistent, tobacco use was associated with poorer responses to systemic antibiotics and secukinumab,[185, 193, 197] and lower rates of HS remission.[191] Clinicians should follow United States Preventative Services Task Force guidance to screen all adults for tobacco use, advise cessation, and offer behavioral and pharmacologic interventions for nonpregnant adults who use tobacco.[306] HS improvement after tobacco cessation was reported in 17% of 140 surveyed patients.[196] No AEs were noted from tobacco cessation pharmacotherapy.[195]

Weight reduction. There is insufficient evidence on weight reduction for HS treatment (**Supplemental Tables 100-102**). Weight management is important for cardiometabolic risk reduction in patients with HS; its direct impact on HS outcomes was examined in 10 cohort studies and case series in 495 patients.[196, 307-314] , Bariatric surgery was associated with lower self-reported HS severity and mean DLQI score than nutritional care in a cohort of 19 patients,[310] and with fewer HS-affected body sites in a registry study of 45 patients.[315] In a cohort study, 27 (60%) of 45 HS patients receiving semaglutide achieved HiSCR-50 at 12 months.[311] Very low-calorie ketogenic diet was associated with reduced mean Sartorius score and DLQI scores at week 4 in 12 patients.[307] Data were limited by small sample sizes, lack of controls, confounding with other HS therapies, and were prone to substantial risks of bias. RCTs comparing the effects of weight reduction on HS outcomes are needed.

Diet. There is insufficient evidence on intermittent fasting,[316] Mediterranean diet,[317-321] yeast exclusion diet,[322-324] and dairy-free diet[196, 325, 326] for HS treatment (**Supplemental Tables 103-106**). Mean IHS4 score modestly decreased from 11.0 to 10.2 in 55 patients

who fasted during the month of Ramadan.[316] Associations between Mediterranean diet adherence and HS severity were inconsistent.[317-321] Self-reported HS improvements and reduced mean pain score were reported with yeast exclusion diet, but low and poorly-reported diet adherence limited study generalizability and real-world feasibility.[322-324] Dairy-free diet was reported to improve HS anecdotally; these data were prone to substantial risks of bias due to small sample sizes, lack of controls, and insufficient consideration of diet adherence.[196, 325, 326] A heart-healthy diet remains important for cardiometabolic risk reduction in patients with HS.

Complementary and Alternative Medicine

Adjunctive Zinc Supplement. We conditionally recommend adjunctive zinc supplementation for HS treatment under clinician guidance based on very low certainty evidence (**Supplemental Table 107**). Zinc gluconate 90mg daily monotherapy showed partial and complete responses in 64% and 36% at 6 months in a pilot study of 22 patients.[200] Zinc gluconate 90mg daily plus topical triclosan 2% BID showed lower median HS severity score, pain VAS, and number of disease flares in a cohort study of 54 patients.[201] Zinc gluconate 90mg plus nicotinamide 30mg daily showed lower mean IHS4 scores, pain VAS, and number of disease flares at 4 months than no treatment in a controlled trial of 92 patients.[202] AEs were reported in 15% of patients with mostly GI symptoms. Zinc supplementation at 90mg daily for HS treatment exceeds the recommended dietary allowance at 11mg daily for men and 8mg/d for women. Clinicians should monitor for drug-drug interaction and zinc toxicity, which may present as GI symptoms, fatigue, copper deficiency, neurological symptoms, anemia, neutropenia, impaired immunity, decreased HDL, or pancreatic disease.

Vitamin D Repletion. We conditionally recommend vitamin D repletion for patients with HS and vitamin D insufficiency or deficiency under clinician guidance based on very low certainty evidence (**Supplemental Table 108**). Sartorius score reduction at 6 months was shown in 75% of 36 patients receiving oral Vitamin D repletion (25,000-50,000 IU monthly).[203] In a pilot study of oral vitamin D repletion in 14 patients, mean nodule count decreased by 51% at 6 months compared with baseline; no AEs were reported.[204] Clinicians should monitor serum 25-OH Vitamin D to guide dosing and duration.

There is insufficient evidence to make a recommendation about myo-inositol, liposomal magnesium and folic acid supplementation[327] and staphage lysate[328] for HS treatment (**Supplemental Tables 109-110**).

Cost

We recognize that costs for the considered therapies may be prohibitive without adequate insurance coverage, while some recommended treatments for HS may be available for a lower cost. Given the available evidence of efficacy and safety, we conclude that the use of the recommended therapies is likely acceptable to patients and providers, and cost should be considered during the shared decision-making process.

Research Gaps

Substantial evidence gaps remain in HS management, with ongoing needs for high-quality RCT and head-to-head comparative effectiveness studies across therapeutic classes, including effects on healthcare utilization. RCT designs should account for high placebo response from the waxing and waning nature of HS. Ensuring HS trials enroll participants reflective of the broader HS population across race, ethnicity, gender, age, and comorbidity burden, is essential for generalizability of study outcomes.[329, 330] Studies are needed to guide HS management in special populations, including children and adolescents, individuals who are pregnant or breastfeeding, and individuals with chronic diseases and chronic infections. [331]

Although consensus efforts have suggested standardized HS definitions, terminology, lesion nomenclature, disease categorization, and outcome frameworks, these standards are inconsistently applied in clinical research, limiting interpretability and comparability across studies. Use of validated objective and patient-reported outcome measures remains essential, including development of tools sensitive to mild disease, where evidence is sparse and no FDA-approved therapies currently exist. Evidence to guide pain management and wound care practices in HS, both in routine care and the postoperative setting, also remains limited.

High-quality evidence is lacking to inform the optimal timing and sequencing of interventions, including integration of medical, procedural, surgical, and wound care approaches, as well as combination and multimodal strategies. Long-term data are limited on durability of response, drug survival, dose optimization, treatment duration, switching strategies, and safety in chronic disease management. Improved longitudinal data on HS clinical course, prognostic and predictive biomarkers, genetic contributors, and the impact of structured nonpharmacologic and lifestyle interventions are needed to support individualized, precision-based care. Prospective data are also lacking in management of burdensome HS symptoms, particularly pain management.

Conclusions

We present 37 evidence-based recommendations. We recommend adalimumab, bimekizumab, infliximab, secukinumab for moderate to severe HS, and recommend routine pain assessment as good clinical practice. We conditionally recommend topical

clindamycin, resorcinol, and ruxolitinib; doxycycline, tetracycline, clindamycin and rifampin, and ertapenem; spironolactone; short-term systemic steroids; upadacitinib; specific procedural interventions; tobacco cessation; supportive pain management; zinc supplementation and vitamin D repletion for HS. We recommend against radiation therapy in pediatric and adolescent patients with HS, and conditionally recommend against the use of acitretin, isotretinoin, avacopan, methotrexate, azathioprine, etanercept, guselkumab, risankizumab, and vilobelimab for HS treatment.

References

1. Andrews J, Guyatt G, Oxman AD, Alderson P, Dahm P, Falck-Ytter Y et al. GRADE guidelines: 14. Going from evidence to recommendations: the significance and presentation of recommendations. J Clin Epidemiol 2013;66:719-25.
2. Andrews JC, Schunemann HJ, Oxman AD, Pottie K, Meerpohl JJ, Coello PA et al. GRADE guidelines: 15. Going from evidence to recommendation-determinants of a recommendation's direction and strength. J Clin Epidemiol 2013;66:726-35.
3. Guyatt GH, Alonso-Coello P, Schunemann HJ, Djulbegovic B, Nothacker M, Lange S et al. Guideline panels should seldom make good practice statements: guidance from the GRADE Working Group. J Clin Epidemiol 2016;80:3-7.
4. Jemec GB. Clinical practice. Hidradenitis suppurativa. N Engl J Med 2012;366:158-64.
5. Frew JW, Lowes MA, Goldfarb N, Butt M, Piguet V, O'Brien E et al. Global Harmonization of Morphological Definitions in Hidradenitis Suppurativa for a Proposed Glossary. JAMA Dermatol 2021;157:449-55.
6. Garg A, Strunk A, Midgette B, Frasier K, Cohn E, Aarts P et al. Standardization of Lesion Classification and Assessment by Investigators in Clinical Trials for Hidradenitis Suppurativa: A Consensus Exercise Using a Modified Delphi Approach. JAMA Dermatol 2026;162:72-9.
7. Kim Y, Lee J, Kim HS, Ko HC, Kim BS, Kim MB , Shin K. Review of Scoring Systems for Hidradenitis Suppurativa. Ann Dermatol 2024;36:9-17.
8. Ingram JR, Hadjieconomou S , Piguet V. Development of core outcome sets in hidradenitis suppurativa: systematic review of outcome measure instruments to inform the process. Br J Dermatol 2016;175:263-72.
9. Westerkam LL, van der Zee HH, Bechara FG, Goldberg S, Jemec GB, Caffrey J et al. Establishment of standardized definitions and a core set of outcome characteristics following hidradenitis suppurativa surgery developed by an expert Delphi consensus. J Am Acad Dermatol 2025;93:1499-508.
10. Thorlacius L, Ingram JR, Villumsen B, Esmann S, Kirby JS, Gottlieb AB et al. A core domain set for hidradenitis suppurativa trial outcomes: an international Delphi process. Br J Dermatol 2018;179:642-50.
11. Folkmann CL, Pinborg EH, Iversen M, Ronnstad ATM, Holgersen N, Nielsen ML et al. The association between hidradenitis suppurativa and psychiatric disease: a systematic review and meta-analysis. Br J Dermatol 2025;193:212-20.

12. Holgersen N, Roseno NAL, Nielsen VW, Hjorthoj C, Nordentoft M, Garg A et al. Risk of New-Onset and Recurrent Depression and Anxiety Among Patients With Hidradenitis Suppurativa. JAMA Dermatol 2025;161:1014-21.
13. Garg A, Malviya N, Strunk A, Wright S, Alavi A, Alhusayen R et al. Comorbidity screening in hidradenitis suppurativa: Evidence-based recommendations from the US and Canadian Hidradenitis Suppurativa Foundations. J Am Acad Dermatol 2022;86:1092-101.
14. Clemmensen OJ. Topical treatment of hidradenitis suppurativa with clindamycin. Int J Dermatol 1983;22:325-8.
15. Aarts P, Reeves JL, Ardon CB, van der Zee HH , Prens EP. Clindamycin-Benzoyl Peroxide Gel Compared with Clindamycin Lotion for Hidradenitis Suppurativa: A Randomized Controlled Assessor-Blinded Intra-Patient Pilot Study. Dermatology 2023;239:670-4.
16. Schultheis M, Staubach P, Nikolakis G, Grabbe S, Ruckes C, von Stebut E et al. LAight® Therapy Significantly Enhances Treatment Efficacy of 16 Weeks of Topical Clindamycin Solution in Hurley I and II Hidradenitis Suppurativa: Results from Period A of RELIEVE, a Multicenter Randomized, Controlled Trial. Dermatology 2022;238:476-86.
17. Jemec GB , Wendelboe P. Topical clindamycin versus systemic tetracycline in the treatment of hidradenitis suppurativa. Journal of the American Academy of Dermatology 1998;39:971-4.
18. Schultheis M, Staubach P, Nikolakis G, Grabbe S, Ruckes C, von Stebut E et al. LAight(R) Therapy Significantly Enhances Treatment Efficacy of 16 Weeks of Topical Clindamycin Solution in Hurley I and II Hidradenitis Suppurativa: Results from Period A of RELIEVE, a Multicenter Randomized, Controlled Trial. Dermatology 2022;238:476-86.
19. Katoulis A, Efthymiou O, Liakou A, Pappa G, Kanelleas A, Koumaki D et al. Resorcinol 10% as a Promising Therapeutic Option for Mild Hidradenitis Suppurativa: A Prospective, Randomized, Open Study. Skin Appendage Disord 2023;9:438-43.
20. Boer J , Jemec GBE. Resorcinol peels as a possible self-treatment of painful nodules in hidradenitis suppurativa. Clin Exp Dermatol 2010;35:36-40.
21. Cordero-Ramos J, Barros-Tornay R, Toledo-Pastrana T, Ferrandiz L, Calleja-Hernandez MA , Moreno-Ramirez D. Effectiveness and safety of topical 15% resorcinol in the management of mild-to-moderate hidradenitis suppurativa: A cohort study. J Dermatol 2022;49:459-62.
22. Docampo-Simón A, Beltrá-Picó I, Sánchez-Pujol MJ, Fuster-Ruiz-de-Apodaca R, Selva-Otaolaurruchi J, Betlloch I , Pascual JC. Topical 15% Resorcinol Is Associated with High Treatment Satisfaction in Patients with Mild to Moderate Hidradenitis Suppurativa. Dermatology 2022;238:82-5.
23. Molinelli E, Brisigotti V, Simonetti O, Campanati A, Sapigni C, D'Agostino GM et al. Efficacy and safety of topical resorcinol 15% as long-term treatment of mild-to-moderate hidradenitis suppurativa: a valid alternative to clindamycin in the panorama of antibiotic resistance. The British Journal of Dermatology 2020;183:1117-9.
24. Pascual JC, Encabo B, Ruiz de Apodaca RF, Romero D, Selva J , Jemec GB. Topical 15% resorcinol for hidradenitis suppurativa: An uncontrolled prospective trial with clinical and ultrasonographic follow-up. Journal of the American Academy of Dermatology 2017;77:1175-8.

25. Boer J , Jemec GB. Resorcinol peels as a possible self-treatment of painful nodules in hidradenitis suppurativa. Clin Exp Dermatol 2010;35:36-40.
26. Porter ML, Ferreira-Cornwell MC, Wang M, Nawaz H , Gooderham MJ. Efficacy and safety of ruxolitinib cream in patients with mild to moderate hidradenitis suppurativa: Results from a randomized, double-blind, vehicle-controlled phase 2 study. Journal of the American Academy of Dermatology 2025.
27. Schell SL, Sennett ML, Feehan RP, Wallace TE, Meiszberg EC, Longenecker AL et al. Pilot study of topical ruxolitinib demonstrates efficacy and blunting of heterogeneous inflammatory processes in mild hidradenitis suppurativa. The British Journal of Dermatology 2025;192:845-56.
28. Incyte C. Study to Evaluate of the Efficacy and Safety of Ruxolitinib Cream in Participants With Hidradenitis Suppurativa. NCT05635838.
29. Kontochristopoulos G, Tsiogka A, Agiasofitou E, Kapsiocha A, Soulaidopoulos S, Liakou AI et al. Efficacy of Subantimicrobial, Modified-Release Doxycycline Compared to Regular-Release Doxycycline for the Treatment of Hidradenitis Suppurativa. Skin Appendage Disord 2022;8:476-81.
30. Aarts P, Koerts NDK, van Huijstee JC, van der Zee HH, Driessen RJB, Horváth B et al. Metformin in conjunction with doxycycline is not superior to doxycycline monotherapy for hidradenitis suppurativa; results of a phase III double-blinded randomized placebo- controlled trial. Br J Dermatol 2025;193:1262-4.
31. Jørgensen A-HR, Yao Y, Thomsen SF , Ring HC. Treatment of hidradenitis suppurativa with tetracycline, doxycycline, or lymecycline: a prospective study. International Journal of Dermatology 2021;60:785-91.
32. Jorgensen AR, Yao Y, Thomsen SF , Ring HC. Treatment of hidradenitis suppurativa with tetracycline, doxycycline, or lymecycline: a prospective study. Int J Dermatol 2021;60:785-91.
33. Bettoli V, Toni G, Odorici G, Forconi R , Corazza M. Oral clindamycin and rifampicin in the treatment of hidradenitis suppurativa-acne inversa in patients of paediatric age: a pilot prospective study. The British Journal of Dermatology 2021;185:216-7.
34. Bettoli V, Zauli S, Borghi A, Toni G, Minghetti S, Ricci M , Virgili A. Oral clindamycin and rifampicin in the treatment of hidradenitis suppurativa-acne inversa: a prospective study on 23 patients. J Eur Acad Dermatol Venereol 2014;28:125-6.
35. Dessinioti C, Zisimou C, Tzanetakou V, Stratigos A , Antoniou C. Oral clindamycin and rifampicin combination therapy for hidradenitis suppurativa: a prospective study and 1-year follow-up. Clin Exp Dermatol 2016;41:852-7.
36. Gener G, Canoui-Poitrine F, Revuz JE, Faye O, Poli F, Gabison G et al. Combination therapy with clindamycin and rifampicin for hidradenitis suppurativa: a series of 116 consecutive patients. Dermatology 2009;219:148-54.
37. Mendonça CO , Griffiths CEM. Clindamycin and rifampicin combination therapy for hidradenitis suppurativa. Br J Dermatol 2006;154:977-8.
38. Yao Y, Jørgensen AHR, Ring HC , Thomsen SF. Effectiveness of clindamycin and rifampicin combination therapy in hidradenitis suppurativa: a 6-month prospective study. Br J Dermatol 2021;184:552-3.

39. van Straalen KR, Tzellos T, Guillem P, Benhadou F, Cuenca-Barrales C, Daxhelet M et al. The efficacy and tolerability of tetracyclines and clindamycin plus rifampicin for the treatment of hidradenitis suppurativa: Results of a prospective European cohort study. Journal of the American Academy of Dermatology 2021;85:369-78.
40. van der Zee HH, Boer J, Prens EP , Jemec GBE. The effect of combined treatment with oral clindamycin and oral rifampicin in patients with hidradenitis suppurativa. Dermatology 2009;219:143-7.
41. Caposiena Caro RD, Molinelli E, Brisigotti V, Offidani A , Bianchi L. Lymecycline vs. clindamycin plus rifampicin in hidradenitis suppurativa treatment: clinical and ultrasonography evaluation. Clin Exp Dermatol 2021;46:96-102.
42. Braunberger TL, Nartker NT, Nicholson CL, Nahhas AF, Parks-Miller A, Hanna Z et al. Ertapenem - a potent treatment for clinical and quality of life improvement in patients with hidradenitis suppurativa. International Journal of Dermatology 2018;57:1088-93.
43. Join-Lambert O, Coignard-Biehler H, Jais J-P, Delage M, Guet-Revillet H, Poirée S et al. Efficacy of ertapenem in severe hidradenitis suppurativa: a pilot study in a cohort of 30 consecutive patients. J Antimicrob Chemother 2016;71:513-20.
44. Nosrati A, Ch'en PY, Torpey ME, Shokrian N, Ball G, Benesh G et al. Efficacy and Durability of Intravenous Ertapenem Therapy for Recalcitrant Hidradenitis Suppurativa. JAMA dermatology 2024;160:312-8.
45. Segura Palacios JM, Soto Moreno A, Valladares Millán I, Rivas Ruiz F, Cuenca Barrales C , Molina Leyva A. Intramuscular ertapenem for the treatment of severe cases hidradenitis suppurativa. J Dermatolog Treat 2023;34:2179368.
46. Gangidi SV, Greene RK, Olsen E, Jackson S , Nakamura M. Efficacy of spironolactone in treating hidradenitis suppurativa in women of childbearing age: a single-center retrospective analysis. Int J Womens Dermatol 2024;10:e159.
47. Golbari NM, Porter ML , Kimball AB. Antiandrogen therapy with spironolactone for the treatment of hidradenitis suppurativa. Journal of the American Academy of Dermatology 2019;80:114-9.
48. Lee A , Fischer G. A case series of 20 women with hidradenitis suppurativa treated with spironolactone. Australas J Dermatol 2015;56:192-6.
49. Masson R, Park SE, Shih T, Hogeling M, Shi VY , Hsiao JL. Spironolactone in hidradenitis suppurativa: a single-center. Int J Womens Dermatol 2024;10:e135.
50. Quinlan C, Kirby B , Hughes R. Spironolactone therapy for hidradenitis suppurativa. Clin Exp Dermatol 2020;45:464-5.
51. Boer J , Nazary M. Long-term results of acitretin therapy for hidradenitis suppurativa. Is acne inversa also a misnomer? The British Journal of Dermatology 2011;164:170-5.
52. Matusiak L, Bieniek A , Szepietowski JC. Acitretin treatment for hidradenitis suppurativa: a prospective series of 17 patients. The British Journal of Dermatology 2014;171:170-4.
53. Molinelli E, Sapigni C, Simonetti O, D'Agostino GM, Brisigotti V, Rizzetto G , Offidani A. Acitretin plus macrolides and acitretin monotherapy in the management of hidradenitis suppurativa. J Eur Acad Dermatol Venereol 2023;37:e392-e4.

54. Sánchez-Díaz M, Díaz-Calvillo P, Rodríguez-Pozo JÁ, Arias-Santiago S , Molina-Leyva A. Effectiveness and Safety of Acitretin for the Treatment of Hidradenitis Suppurativa, Predictors of Clinical Response: A Cohort Study. Dermatology 2023;239:52-9.
55. Tan MG, Shear NH, Walsh S , Alhusayen R. Acitretin. J Cutan Med Surg 2017;21:48-53.
56. Boer J , van Gemert MJ. Long-term results of isotretinoin in the treatment of 68 patients with hidradenitis suppurativa. Journal of the American Academy of Dermatology 1999;40:73-6.
57. van der Zee HH, Longcore M, Geng Z , Garg A. Weekly adalimumab treatment decreased disease flare in hidradenitis suppurativa over 36 weeks: integrated results from the phase 3 PIONEER trials. J Eur Acad Dermatol Venereol 2020;34:1050-6.
58. Glatt S, Jemec GBE, Forman S, Sayed C, Schmieder G, Weisman J et al. Efficacy and Safety of Bimekizumab in Moderate to Severe Hidradenitis Suppurativa: A Phase 2, Double-blind, Placebo-Controlled Randomized Clinical Trial. JAMA Dermatol 2021;157:1279-88.
59. Kimball AB, Kerdel F, Adams D, Mrowietz U, Gelfand JM, Gniadecki R et al. Adalimumab for the treatment of moderate to severe Hidradenitis suppurativa: a parallel randomized trial. Ann Intern Med 2012;157:846-55.
60. Kimball AB, Sundaram M, Shields AL, Hudgens S, Okun M, Foley C , Ganguli A. Adalimumab alleviates skin pain in patients with moderate-to-severe hidradenitis suppurativa: Secondary efficacy results from the PIONEER I and PIONEER II randomized controlled trials. J Am Acad Dermatol 2018;79:1141-3.
61. Tzellos T, van Straalen KR, Kyrgidis A, Alavi A, Goldfarb N, Gulliver W et al. Development and validation of IHS4-55, an IHS4 dichotomous outcome to assess treatment effect for hidradenitis suppurativa. J Eur Acad Dermatol Venereol 2023;37:395-401.
62. Kimball AB, Okun MM, Williams DA, Gottlieb AB, Papp KA, Zouboulis CC et al. Two Phase 3 Trials of Adalimumab for Hidradenitis Suppurativa. N Engl J Med 2016;375:422-34.
63. Kimball AB, Sobell JM, Zouboulis CC, Gu Y, Williams DA, Sundaram M et al. HiSCR (Hidradenitis Suppurativa Clinical Response): a novel clinical endpoint to evaluate therapeutic outcomes in patients with hidradenitis suppurativa from the placebo-controlled portion of a phase 2 adalimumab study. J Eur Acad Dermatol Venereol 2016;30:989-94.
64. Bechara FG, Podda M, Prens EP, Horvath B, Giamarellos-Bourboulis EJ, Alavi A et al. Efficacy and Safety of Adalimumab in Conjunction With Surgery in Moderate to Severe Hidradenitis Suppurativa: The SHARPS Randomized Clinical Trial. JAMA Surg 2021;156:1001-9.
65. Kimball AB, Jemec GBE, Sayed CJ, Kirby JS, Prens E, Ingram JR et al. Efficacy and safety of bimekizumab in patients with moderate-to-severe hidradenitis suppurativa (BE HEARD I and BE HEARD II): two 48-week, randomised, double-blind, placebo-controlled, multicentre phase 3 trials. Lancet 2024;403:2504-19.
66. Grant A, Gonzalez T, Montgomery MO, Cardenas V , Kerdel FA. Infliximab therapy for patients with moderate to severe hidradenitis suppurativa: a randomized, double-blind, placebo-controlled crossover trial. J Am Acad Dermatol 2010;62:205-17.
67. Paradela S, Rodriguez-Lojo R, Fernandez-Torres R, Arevalo P , Fonseca E. Long-term efficacy of infliximab in hidradenitis suppurativa. J Dermatolog Treat 2012;23:278-83.

68. Mekkes JR , Bos JD. Long-term efficacy of a single course of infliximab in hidradenitis suppurativa. Br J Dermatol 2008;158:370-4.
69. Lesage C, Adnot-Desanlis L, Perceau G, Bonnet M, Palot JP, Bernard P , Reguiai Z. Efficacy and tolerance of prolonged infliximab treatment of moderate-to-severe forms of hidradenitis suppurativa. Eur J Dermatol 2012;22:640-4.
70. Montaudie H, Seitz-Polski B, Cornille A, Benzaken S, Lacour JP , Passeron T. Interleukin 6 and high-sensitivity C-reactive protein are potential predictive markers of response to infliximab in hidradenitis suppurativa. J Am Acad Dermatol 2017;76:156-8.
71. Ghias MH, Johnston AD, Kutner AJ, Micheletti RG, Hosgood HD , Cohen SR. High-dose, high-frequency infliximab: A novel treatment paradigm for hidradenitis suppurativa. J Am Acad Dermatol 2020;82:1094-101.
72. Islam Z, Wong JH, Alicea DS, Choi S, Andriano TM , Campton K. Three-week infliximab dosing is associated with improved disease control in severe hidradenitis suppurativa: A retrospective study. J Am Acad Dermatol 2025.
73. Westerkam LL, Tackett KJ , Sayed CJ. Comparing the Effectiveness and Safety Associated With Infliximab vs Infliximab-abda Therapy for Patients With Hidradenitis Suppurativa. JAMA Dermatol 2021;157:708-11.
74. Shih T, Lee K, Grogan T, De DR, Shi VY , Hsiao JL. Infliximab in hidradenitis suppurativa: A systematic review and meta-analysis. Dermatol Ther 2022;35:e15691.
75. Oskardmay AN, Miles JA , Sayed CJ. Determining the optimal dose of infliximab for treatment of hidradenitis suppurativa. J Am Acad Dermatol 2019;81:702-8.
76. Kimball AB, Jemec GBE, Alavi A, Reguiai Z, Gottlieb AB, Bechara FG et al. Secukinumab in moderate-to-severe hidradenitis suppurativa (SUNSHINE and SUNRISE): week 16 and week 52 results of two identical, multicentre, randomised, placebo-controlled, double-blind phase 3 trials. Lancet 2023;401:747-61.
77. Adams DR, Yankura JA, Fogelberg AC , Anderson BE. Treatment of hidradenitis suppurativa with etanercept injection. Arch Dermatol 2010;146:501-4.
78. Pelekanou A, Kanni T, Savva A, Mouktaroudi M, Raftogiannis M, Kotsaki A , Giamarellos-Bourboulis EJ. Long-term efficacy of etanercept in hidradenitis suppurativa: results from an open-label phase II prospective trial. Exp Dermatol 2010;19:538-40.
79. Lee RA, Dommasch E, Treat J, Sciacca-Kirby J, Chachkin S, Williams J et al. A prospective clinical trial of open-label etanercept for the treatment of hidradenitis suppurativa. J Am Acad Dermatol 2009;60:565-73.
80. Giamarellos-Bourboulis EJ, Pelekanou E, Antonopoulou A, Petropoulou H, Baziaka F, Karagianni V et al. An open-label phase II study of the safety and efficacy of etanercept for the therapy of hidradenitis suppurativa. Br J Dermatol 2008;158:567-72.
81. Cusack C , Buckley C. Etanercept: effective in the management of hidradenitis suppurativa. Br J Dermatol 2006;154:726-9.
82. Kimball AB, Podda M, Alavi A, Miller M, Shen YK, Li S et al. Guselkumab for the treatment of patients with moderate-to-severe hidradenitis suppurativa: A phase 2 randomized study. J Eur Acad Dermatol Venereol 2023;37:2098-108.
83. Kimball AB, Prens EP, Passeron T, Maverakis E, Turchin I, Beeck S et al. Efficacy and Safety of Risankizumab for the Treatment of Hidradenitis Suppurativa: A Phase 2, Randomized, Placebo-Controlled Trial. Dermatol Ther (Heidelb) 2023;13:1099-111.

84. Giamarellos-Bourboulis EJ, Jemec GBE, Prens EP, Riedemann NC, Otto I, Weisman J et al. Vilobelimab to improve clinical outcomes of moderate-to-severe hidradenitis suppurativa through an adjunctive effect on draining tunnels: Results of the SHINE double-blind, placebo-controlled randomised trial. Br J Dermatol 2025:ljaf398.
85. Ackerman LS, Schlosser BJ, Zhan T, Prajapati VH, Fretzin S, Takahashi H et al. Improvements in moderate-to-severe hidradenitis suppurativa with upadacitinib: Results from a phase 2, randomized, placebo-controlled study. J Am Acad Dermatol 2025;92:1252-60.
86. Wong D, Walsh S , Alhusayen R. Low-dose systemic corticosteroid treatment for recalcitrant hidradenitis suppurativa. J Am Acad Dermatol 2016;75:1059-62.
87. Gibson RS, Snyder CL, Porter ML , Kimball AB. Prednisone and amoxicillin/clavulanic acid for the treatment of hidradenitis suppurativa flares: a prospective observational study. Int J Womens Dermatol 2024;10:e162.
88. Duarte B, Cunha N, Lencastre A , Cabete J. Systemic Steroids in the Management of Moderate-to-severe Hidradenitis Suppurativa. Actas Dermosifiliogr (Engl Ed) 2020;111:879-83.
89. Savage KT, Brant EG, Rosales Santillan M, Morss PC, Salian P, Flood KS et al. Methotrexate shows benefit in a subset of patients with severe hidradenitis suppurativa. Int J Womens Dermatol 2020;6:159-63.
90. Nazary M, Prens EP , Boer J. Azathioprine lacks efficacy in hidradenitis suppurativa: a retrospective study of nine patients. Br J Dermatol 2016;174:639-41.
91. Lopez Riquelme I, Fernandez Ballesteros MD, Perea Polak A, Serrano Ordonez A , Martinez Pilar L. Azathioprine in hidradenitis suppurativa with inflammatory phenotype: a case series of 11 patients. Int J Dermatol 2023;62:1300-3.
92. Kirby JS, Prens E, Jemec GB, v M, Prasad S, Schall T et al. LB791 Avacopan, a highly selective small molecule inhibitor of c5a receptor, in patients with Hidradenitis Suppurativa: Initial results from a randomized, double-blind, placebo-controlled, phase 2 study (aurora). Journal of Investigative Dermatology 2021;141:B19.
93. Vu TT, Soong LC, Hagtvedt R , Keeling CP. Surgical Deroofing in the Management of Hidradenitis Suppurativa Alone or as an Adjunct to Medical Therapies. Dermatol Surg 2025;51:e17-e21.
94. van der Zee HH, Prens EP , Boer J. Deroofing: a tissue-saving surgical technique for the treatment of mild to moderate hidradenitis suppurativa lesions. J Am Acad Dermatol 2010;63:475-80.
95. Sechi A, Caposiena Caro RD, Michelucci A, Dini V, Piaserico S, Zalaudek I et al. CO 2 Laser Versus Surgical Deroofing for the Treatment of Hidradenitis Suppurativa Tunnels: A Comparative Multicentric, Retrospective Study. Dermatol Surg 2025;51:389-95.
96. Pham J, Sholji T, Guttman L, Allan T , Frew JW. Predictors of wound healing after surgical deroofing in Hidradenitis Suppurativa. Australas J Dermatol 2024;65:636-41.
97. Krajewski PK, Sanz-Motilva V, Flores Martinez S, Solera M, Ochando G, Jfri A , Martorell A. Deroofing: A safe, effective and well-tolerated procedure in patients with hidradenitis suppurativa. J Eur Acad Dermatol Venereol 2024;38:931-6.

98. Dahmen RA, Gkalpakiotis S, Mardesicova L, Arenberger P , Arenbergerova M. Deroofing followed by thorough sinus tract excision: a modified surgical approach for hidradenitis suppurativa. J Dtsch Dermatol Ges 2019;17:698-702.
99. Mortimore AM, Watson L , McMeniman EK. Hidradenitis Suppurativa Deroofing Surgery Outcomes Including Pain Scores, Surface Area Reduction and Patient Satisfaction in an Australian Cohort. Australas J Dermatol 2025.
100. Ravi S, Miles JA, Steele C, Christiansen MK , Sayed CJ. Patient Impressions and Outcomes After Clinic-Based Hidradenitis Suppurativa Surgery. JAMA Dermatol 2022;158:132-41.
101. Kohorst JJ, Baum CL, Otley CC, Roenigk RK, Schenck LA, Pemberton JH et al. Surgical Management of Hidradenitis Suppurativa: Outcomes of 590 Consecutive Patients. Dermatol Surg 2016;42:1030-40.
102. Ritz JP, Runkel N, Haier J , Buhr HJ. Extent of surgery and recurrence rate of hidradenitis suppurativa. Int J Colorectal Dis 1998;13:164-8.
103. Revankar RR, Blum F, Yeung H, Patel HA, Holahan H, Vedak P , Sayed CJ. Factors influencing patient experience during incision and drainage procedures in hidradenitis suppurativa: an analysis of patient-reported outcomes. Br J Dermatol 2023;189:779-80.
104. van Rappard DC, Mooij JE , Mekkes JR. Mild to moderate hidradenitis suppurativa treated with local excision and primary closure. J Eur Acad Dermatol Venereol 2012;26:898-902.
105. Blok JL, Boersma M, Terra JB, Spoo JR, Leeman FW, van den Heuvel ER et al. Surgery under general anaesthesia in severe hidradenitis suppurativa: a study of 363 primary operations in 113 patients. J Eur Acad Dermatol Venereol 2015;29:1590-7.
106. Bieniek A, Matusiak L, Okulewicz-Gojlik D , Szepietowski JC. Surgical treatment of hidradenitis suppurativa: experiences and recommendations. Dermatol Surg 2010;36:1998-2004.
107. Aksakal AB , Adisen E. Hidradenitis suppurativa: importance of early treatment; efficient treatment with electrosurgery. Dermatol Surg 2008;34:228-31.
108. Yamashita Y, Hashimoto I, Matsuo S, Abe Y, Ishida S , Nakanishi H. Two-stage surgery for hidradenitis suppurativa: staged artificial dermis and skin grafting. Dermatol Surg 2014;40:110-5.
109. Wormald JC, Balzano A, Clibbon JJ , Figus A. Surgical treatment of severe hidradenitis suppurativa of the axilla: thoracodorsal artery perforator (TDAP) flap versus split skin graft. J Plast Reconstr Aesthet Surg 2014;67:1118-24.
110. Wollina U, Langner D, Heinig B , Nowak A. Comorbidities, treatment, and outcome in severe anogenital inverse acne (hidradenitis suppurativa): a 15-year single center report. Int J Dermatol 2017;56:109-15.
111. Wollina U, Tilp M, Meseg A, Schonlebe J, Heinig B , Nowak A. Management of severe anogenital acne inversa (hidradenitis suppurativa). Dermatol Surg 2012;38:110-7.
112. Walter AC, Meissner M, Kaufmann R, Valesky E , Pinter A. Hidradenitis Suppurativa After Radical Surgery-Long-Term Follow-up for Recurrences and Associated Factors. Dermatol Surg 2018;44:1323-31.

113. Varkarakis G, Daniels J, Coker K, Oswald T, Akdemir O , Lineaweaver WC. Treatment of axillary hidradenitis with transposition flaps: a 6-year experience. Ann Plast Surg 2010;64:592-4.
114. Unal C, Yirmibesoglu OA, Ozdemir J , Hasdemir M. Superior and inferior gluteal artery perforator flaps in reconstruction of gluteal and perianal/perineal hidradenitis suppurativa lesions. Microsurgery 2011;31:539-44.
115. Tchero H, Herlin C, Bekara F, Fluieraru S , Teot L. Two-stage surgical repair in 31 patients with stage II-III hidradenitis suppurativa. Int J Dermatol 2018;57:745-7.
116. Soldin MG, Tulley P, Kaplan H, Hudson DA , Grobbelaar AO. Chronic axillary hidradenitis--the efficacy of wide excision and flap coverage. Br J Plast Surg 2000;53:434-6.
117. Sirvan SS, Demir IA, Irmak F, Sevim KZ, Dagdelen D, Yazar SK , Karsidag S. Posterior Arm Perforator Flap for Axillary Reconstruction After Hidradenitis Suppurativa Excision. Plast Surg (Oakv) 2019;27:204-10.
118. Romanowski KS, Fagin A, Werling B, Kass G, Liao J, Granchi T et al. Surgical Management of Hidradenitis Suppurativa: A 14-Year Retrospective Review of 98 Consecutive Patients. J Burn Care Res 2017;38:365-70.
119. Posch C, Monshi B, Quint T, Vujic I, Lilgenau N , Rappersberger K. The role of wide local excision for the treatment of severe hidradenitis suppurativa (Hurley grade III): Retrospective analysis of 74 patients. J Am Acad Dermatol 2017;77:123-9 e5.
120. Nail-Barthelemy R, Stroumza N, Qassemyar Q, Delage M, Nassif A , Atlan M. Evaluation of the mobility of the shoulder and quality of life after perforator flaps for recalcitrant axillary hidradenitis. Ann Chir Plast Esthet 2019;64:68-77.
121. Mutaf M, Gunal E, Berberoglu O , Gokce A. Surgical treatment of extensive sacrococcygeal hidradenitis suppurativa with triangular closure technique. Ann Plast Surg 2014;73:583-7.
122. Mirza MAR , Aamir S. Surgical management of acne inversa. Journal of Pakistan Association of Dermatologists 2012;22.
123. Mandal A , Watson J. Experience with different treatment modules in hidradenitis suppuritiva: a study of 106 cases. Surgeon 2005;3:23-6.
124. Maghsoudi H, Almasi H , Miri Bonjar MR. Men, main victims of hidradenitis suppurativa (A prospective cohort study). Int J Surg 2018;50:6-10.
125. Maeda T, Kimura C, Murao N , Takahashi K. Promising long-term outcomes of the reused skin-graft technique for chronic gluteal hidradenitis suppurativa. J Plast Reconstr Aesthet Surg 2015;68:1268-75.
126. Brierley NA , Al-Ghazal S. Improving outcomes in hidradenitis suppurativa. J Plast Reconstr Aesthet Surg 2017;70:143-4.
127. Kuo HW , Ohara K. Surgical treatment of chronic gluteal hidradenitis suppurativa: reused skin graft technique. Dermatol Surg 2003;29:173-8.
128. Horoz U, Keles M, Seven E, Karamursel S , Tellioglu A. Surgically treating hidradenitis suppurativa that does not respond to medical treatment. Turk J Plast Surg 2018;26:67.
129. Humphries LS, Kueberuwa E, Beederman M , Gottlieb LJ. Wide excision and healing by secondary intent for the surgical treatment of hidradenitis suppurativa: A single-center experience. J Plast Reconstr Aesthet Surg 2016;69:554-66.

130. Deckers IE, Dahi Y, van der Zee HH , Prens EP. Hidradenitis suppurativa treated with wide excision and second intention healing: a meaningful local cure rate after 253 procedures. J Eur Acad Dermatol Venereol 2018;32:459-62.
131. Chen YE, Gerstle T, Verma K, Treiser MD, Kimball AB , Orgill DP. Management of hidradenitis suppurativa wounds with an internal vacuum-assisted closure device. Plast Reconstr Surg 2014;133:370e-7e.
132. Busnardo FF, Coltro PS, Olivan MV, Busnardo APV , Ferreira MC. The thoracodorsal artery perforator flap in the treatment of axillary hidradenitis suppurativa: effect on preservation of arm abduction. Plast Reconstr Surg 2011;128:949-53.
133. Burney RE. 35-Year Experience with Surgical Treatment of Hidradenitis Suppurativa. World J Surg 2017;41:2723-30.
134. Balik E, Eren T, Bulut T, Buyukuncu Y, Bugra D , Yamaner S. Surgical approach to extensive hidradenitis suppurativa in the perineal/perianal and gluteal regions. World J Surg 2009;33:481-7.
135. Altmann S, Fansa H , Schneider W. Axillary hidradenitis suppurativa: a further option for surgical treatment. J Cutan Med Surg 2004;8:6-10.
136. Alharbi Z, Kauczok J , Pallua N. A review of wide surgical excision of hidradenitis suppurativa. BMC Dermatol 2012;12:9.
137. Schmidt M, Dunst-Huemer KM, Lazzeri D, Schoeffl H , Huemer GM. The versatility of the islanded posterior arm flap for regional reconstruction around the axilla. J Plast Reconstr Aesthet Surg 2015;68:953-9.
138. Rompel R , Petres J. Long-term results of wide surgical excision in 106 patients with hidradenitis suppurativa. Dermatol Surg 2000;26:638-43.
139. Prandl E, Arbab E, Schintler M, Spendel S , Scharnagl E. Acne inversa of the anogenital region: early radical surgical excision with plastic defect coverage is treatment of choice. J Eur Acad Dermatol Venereol 2008;22:754-5.
140. Ortiz CL, Castillo VL, Pilarte FS , Barraguer EL. Experience using the thoracodorsal artery perforator flap in axillary hidradentitis suppurativa cases. Aesthetic Plast Surg 2010;34:785-92.
141. Nesmith RB, Merkel KL , Mast BA. Radical surgical resection combined with lymphadenectomy-directed antimicrobial therapy yielding cure of severe axillary hidradenitis. Ann Plast Surg 2013;70:538-41.
142. Mendes R, Zatz RF, Modolin MLA, Busnardo FF , Gemperli R. Radical resection and local coverage of hidradenitis suppurativa - acne inversa: analysis of results. Rev Col Bras Cir 2018;45:e1719.
143. Marchesi A, Marcelli S, Zingaretti N, Parodi PC , Vaienti L. Pedicled Thoracodorsal Artery Perforator and Muscle-Sparing Latissimus Dorsi Flaps in the Axillary Reconstruction After Hidradenitis Suppurativa Excision: Functional and Aesthetic Issues. Ann Plast Surg 2018;81:694-701.
144. Elgohary H, Nawar AM, Zidan A, Shoulah AA, Younes MT , Hamed AM. Outcome of Pedicled Thoracodorsal Artery Perforator Flap in the Surgical Treatment of Stage II and III Hidradenitis Suppurativa of Axilla. Ann Plast Surg 2018;81:688-93.

145. Elboraey MA, Alali AB , Alkandari QA. Immediate and Delayed Reconstruction after Excision of Axillary Hidradenitis Suppurativa Using a Propeller Flap. Plast Reconstr Surg Glob Open 2019;7:e2387.
146. Egemen O, Ozkaya O, Bingol D, Orman C , Akan M. Islanded perforator flaps in the reconstruction of hidradenitis suppurativa defects. J Reconstr Microsurg 2013;29:297-302.
147. DeFazio MV, Economides JM, King KS, Han KD, Shanmugam VK, Attinger CE , Evans KK. Outcomes After Combined Radical Resection and Targeted Biologic Therapy for the Management of Recalcitrant Hidradenitis Suppurativa. Ann Plast Surg 2016;77:217-22.
148. Buyukasik O, Hasdemir AO, Kahramansoy N, Col C , Erkol H. Surgical approach to extensive hidradenitis suppurativa. Dermatol Surg 2011;37:835-42.
149. Bieniek A, Majda F, Chlebicka I, Knecht-Gurwin K , Szepietowski JC. Surgical Treatment of Axillary Hidradenitis Suppurativa Using Preliminary Defect Closure and Two Sliding Island Triangular Skin-Subcutaneous Flaps from the Arm and Chest. J Clin Med 2025;14.
150. Butrón-Bris B, Lladó I, Gallo E, Navarro R, Rodríguez-Jiménez P , Delgado-Jiménez Y. Wide Excision in Hidradenitis Suppurativa. Does it Modify the Course of Disease? Actas Dermosifiliogr 2023;114:536-40.
151. Chang TH, Sheen YS , Liao YH. Surgical outcomes of hidradenitis suppurativa: evaluating factors influencing recurrence and complications after 284 complete excisions. Clin Exp Dermatol 2024;49:1554-60.
152. Cuenca-Barrales C, Montero-Vílchez T, Sanchez-Diaz M, Rodríguez-Pozo J, Díaz-Calvillo P, Martinez-Lopez A et al. Patterns of Surgical Recurrence in Patients with Hidradenitis Suppurativa. Dermatology 2023;239:255-61.
153. Judge AC , Tahernia AH. Hidradenitis Suppurativa: Radical Surgical Excisions with Staged Reconstructions: A Single-Surgeon Retrospective Review of 71 Patients. Adv Skin Wound Care 2024;37:1-8.
154. Michelucci A, Fidanzi C, Manzo Margiotta F, Granieri G, Salvia G, Janowska A et al. Presurgical Mapping With Ultra-high Frequency Ultrasound of Hidradenitis Suppurativa Lesions Treated With Wide Local Excision and Secondary Intention Healing. Dermatol Surg 2025;51:36-9.
155. Michelucci A, Manzo Margiotta F, Salvia G, Vietina A, Janowska A, Morganti R et al. Effectiveness of wide local excision and secondary intention healing in hidradenitis suppurativa: a single-centre study on quality of life and mental health outcomes. Clin Exp Dermatol 2025;50:836-40.
156. Ocker L, Abu Rached N, Koller A, Frost C, Käpynen R , Bechara FG. The Impact of Surgery on Quality of Life in Hidradenitis Suppurativa: Results from a Prospective Single-Center Study. Life (Basel) 2025;15.
157. Romanowski KS, Galet C, Torres M , Wibbenmeyer L. Evaluation of Outcomes Following Surgical Treatment of Hidradenitis Suppurativa. J Burn Care Res 2023;44:880-6.
158. Finley EM , Ratz JL. Treatment of hidradenitis suppurativa with carbon dioxide laser excision and second-intention healing. Journal of the American Academy of Dermatology 1996;34:465-9.

159. Hazen PG , Hazen BP. Hidradenitis suppurativa: successful treatment using carbon dioxide laser excision and marsupialization. Dermatologic Surgery: Official Publication for American Society for Dermatologic Surgery [et Al] 2010;36:208-13.
160. Madan V, Hindle E, Hussain W , August PJ. Outcomes of treatment of nine cases of recalcitrant severe hidradenitis suppurativa with carbon dioxide laser. The British Journal of Dermatology 2008;159:1309-14.
161. Dalrymple JC , Monaghan JM. Treatment of hidradenitis suppurativa with the carbon dioxide laser. Br J Surg 1987;74:420.
162. Lapins J, Marcusson JA , Emtestam L. Surgical treatment of chronic hidradenitis suppurativa: CO2 laser stripping-secondary intention technique. The British Journal of Dermatology 1994;131:551-6.
163. Lapins J, Sartorius K , Emtestam L. Scanner-assisted carbon dioxide laser surgery: a retrospective follow-up study of patients with hidradenitis suppurativa. Journal of the American Academy of Dermatology 2002;47:280-5.
164. Mikkelsen PR, Dufour DN, Zarchi K , Jemec GBE. Recurrence rate and patient satisfaction of CO2 laser evaporation of lesions in patients with hidradenitis suppurativa: a retrospective study. Dermatologic Surgery: Official Publication for American Society for Dermatologic Surgery [et Al] 2015;41:255-60.
165. Sherman AI , Reid R. CO2 laser for suppurative hidradenitis of the vulva. J Reprod Med 1991;36:113-7.
166. Sidhom S, Petry SU, Ward R , Daveluy S. Treatment of hidradenitis suppurativa with 755-nm alexandrite laser hair removal: A randomized controlled trial. JAAD Int 2024;16:239-43.
167. Molinelli E, Sapigni C, Simonetti O, Brisigotti V, Giuliodori K , Offidani A. Alexandrite laser as an adjuvant therapy in the management of mild to moderate hidradenitis suppurativa: A controlled prospective clinical study. J Am Acad Dermatol 2022;87:674-5.
168. Fradet M, Bulai Livideanu C, Katoulis A, Hegazy S, Bouznad A, Jendoubi F et al. Efficacy and tolerability of long-pulse Alexandrite laser hair removal for hidradenitis suppurativa. Eur J Dermatol 2021.
169. Naouri M, Maruani A, Lagrange S, Cogrel O, Servy A, Collet Vilette AM et al. Treatment of hidradenitis suppurativa using a long-pulsed hair removal neodymium:yttrium-aluminium-garnet laser: A multicenter, prospective, randomized, intraindividual, comparative trial. J Am Acad Dermatol 2021;84:203-5.
170. Vossen A, van der Zee HH, Terian M, van Doorn MBA , Prens EP. Laser hair removal alters the disease course in mild hidradenitis suppurativa. J Dtsch Dermatol Ges 2018;16:901-3.
171. Grimstad O, Kvammen BO , Swartling C. Botulinum Toxin Type B for Hidradenitis Suppurativa: A Randomised, Double-Blind, Placebo-Controlled Pilot Study. Am J Clin Dermatol 2020;21:741-8.
172. Goandal NF, Jemec GBE , Saunte DML. Botulinum toxin type A efficacy on pain and suppuration in hidradenitis suppurativa. J Eur Acad Dermatol Venereol 2025;39:e875-e8.
173. Fajgenbaum K, Crouse L, Dong L, Zeng D , Sayed C. Intralesional Triamcinolone May Not Be Beneficial for Treating Acute Hidradenitis Suppurativa Lesions: A Double-Blind, Randomized, Placebo-Controlled Trial. Dermatol Surg 2020;46:685-9.

174. Salvador-Rodriguez L, Arias-Santiago S , Molina-Leyva A. Ultrasound-assisted intralesional corticosteroid infiltrations for patients with hidradenitis suppurativa. Sci Rep 2020;10:13363.
175. Sechi A, Patrizi A , Raone B. Intralesional steroid injections to target sinus tract fibrosis in hidradenitis suppurativa: Results from an ultrasound-based retrospective study. Dermatol Ther 2022;35:e15710.
176. Riis PT, Boer J, Prens EP, Saunte DM, Deckers IE, Emtestam L et al. Intralesional triamcinolone for flares of hidradenitis suppurativa (HS): A case series. J Am Acad Dermatol 2016;75:1151-5.
177. Garcia-Martinez FJ, Vilarrasa Rull E, Salgado-Boquete L, Martorell A, Pascual JC, Hernandez-Martin A et al. Intralesional corticosteroid injection for the treatment of hidradenitis suppurativa: a multicenter retrospective clinical study. J Dermatolog Treat 2021;32:286-90.
178. Iannone M, Janowska A, Oranges T, Balderi L, Benincasa BB, Vitali S et al. Ultrasound-guided injection of intralesional steroids in acute hidradenitis suppurativa lesions: A prospective study. Dermatol Ther 2021;34:e15068.
179. Fania L, Clemente A, Sampogna F, Mazzanti C, Pallotta S, Panebianco A et al. Intralesional ultrasound-guided combined treatment with triamcinolone plus lincomycin in hidradenitis suppurativa: A pilot study. Dermatol Ther 2020;33:e13901.
180. Benesh G, Andriano TM, Hosgood HD , Cohen SR. Efficacy and Patient Satisfaction Associated With Intramuscular Triamcinolone Therapy for Acute Flares of Hidradenitis Suppurativa. J Cutan Med Surg 2023;27:350-7.
181. Alvarez P, Garcia-Martinez FJ, Poveda I , Pascual JC. Intralesional Triamcinolone for Fistulous Tracts in Hidradenitis Suppurativa: An Uncontrolled Prospective Trial with Clinical and Ultrasonographic Follow-Up. Dermatology 2020;236:46-51.
182. Giorgio CM, Licata G, Fulgione E, Argenziano G , Di Brizzi EV. Intralesional Clindamycin and Triamcinolone for Hidradenitis Suppurativa: A Targeted Therapeutic Approach for Rapid Inflammation Control-A Prospective Case Series. Int J Dermatol 2025;64:1961-3.
183. Surapaneni V, Milosavljevic MV , Orenstein LAV. Pain management in hidradenitis suppurativa. J Am Acad Dermatol 2024;91:S52-S63.
184. Dowell D, Ragan KR, Jones CM, Baldwin GT , Chou R. CDC Clinical Practice Guideline for Prescribing Opioids for Pain - United States, 2022. MMWR Recomm Rep 2022;71:1-95.
185. Iannone M, Janowska A, Bartolomei G, Puntoni M, Oranges T, Romanelli M , Dini V. Systemic antibiotics in hidradenitis suppurativa: efficacy and effects of body mass index and smoking pack-year on the response to therapy. Dermatol Ther 2021;34:e14919.
186. Vazquez BG, Alikhan A, Weaver AL, Wetter DA , Davis MD. Incidence of hidradenitis suppurativa and associated factors: a population-based study of Olmsted County, Minnesota. J Invest Dermatol 2013;133:97-103.
187. Schrader AM, Deckers IE, van der Zee HH, Boer J , Prens EP. Hidradenitis suppurativa: a retrospective study of 846 Dutch patients to identify factors associated with disease severity. J Am Acad Dermatol 2014;71:460-7.

188. Sartorius K, Emtestam L, Jemec GB , Lapins J. Objective scoring of hidradenitis suppurativa reflecting the role of tobacco smoking and obesity. Br J Dermatol 2009;161:831-9.
189. Omine T, Miyagi T, Hayashi K, Yamaguchi S , Takahashi K. Clinical characteristics of hidradenitis suppurativa patients in Okinawa, Japan: Differences between East Asia and Western countries. J Dermatol 2020;47:855-62.
190. Liakou AI, Kontochristopoulos G, Marnelakis I, Tsantes AG, Papadakis M, Alevizou A et al. Thyroid Disease and Active Smoking May Be Associated with More Severe Hidradenitis Suppurativa: Data from a Prospective Cross Sectional Single-Center Study. Dermatology 2021;237:125-30.
191. Kjaersgaard Andersen R, Loft IC, Hansen T, Hjalgrim H, Rostgaard K, Banasik K et al. Incidence and remission rates of self-reported hidradenitis suppurativa - A prospective cohort study conducted in Danish blood donors. J Eur Acad Dermatol Venereol 2022;36:717-25.
192. Dessinioti C, Zisimou C, Tzanetakou V, Ntritsos G, Kontochristopoulos G , Antoniou C. A retrospective institutional study of the association of smoking with the severity of hidradenitis suppurativa. J Dermatol Sci 2017;87:206-7.
193. Denny G , Anadkat MJ. The effect of smoking and age on the response to first-line therapy of hidradenitis suppurativa: An institutional retrospective cohort study. J Am Acad Dermatol 2017;76:54-9.
194. Canoui-Poitrine F, Revuz JE, Wolkenstein P, Viallette C, Gabison G, Pouget F et al. Clinical characteristics of a series of 302 French patients with hidradenitis suppurativa, with an analysis of factors associated with disease severity. J Am Acad Dermatol 2009;61:51-7.
195. Siddiquee S, Marshman G, Sallis JA , Potter JA. Smoking cessation outcomes in patients with hidradenitis suppurativa: a retrospective analysis. Clin Exp Dermatol 2021;46:945-6.
196. Macklis PC, Tyler K, Kaffenberger J, Kwatra S , Kaffenberger BH. Lifestyle modifications associated with symptom improvement in hidradenitis suppurativa patients. Arch Dermatol Res 2022;314:293-300.
197. Abu Rached N, Haven Y, Ocker L, Stockfleth E , Bechara FG. Real-world data about secukinumab in hidradenitis suppurativa: tobacco pack years an underestimated factor. Clin Exp Dermatol 2025;50:439-41.
198. Chastagner M, Donzier L, Benhadou F, Villani AP , Guillem P. The Dose-Response Relationship between Tobacco Smoking and Hidradenitis Suppurativa: Results from an Observational Study of 1,689 Patients. Dermatology 2025;241:371-80.
199. Kaya G, Özgen FP, Kelahmetoğlu O, Su Küçük Ö , Onsun N. Demographic features, clinical characteristics, and comorbid relation in hidradenitis suppurativa: a population-based study. Front Med (Lausanne) 2024;11:1499509.
200. Brocard A, Knol AC, Khammari A , Dreno B. Hidradenitis suppurativa and zinc: a new therapeutic approach. A pilot study. Dermatology 2007;214:325-7.
201. Hessam S, Sand M, Meier NM, Gambichler T, Scholl L , Bechara FG. Combination of oral zinc gluconate and topical triclosan: An anti-inflammatory treatment modality for initial hidradenitis suppurativa. J Dermatol Sci 2016;84:197-202.

202. Molinelli E, Brisigotti V, Campanati A, Sapigni C, Giacchetti A, Cota C , Offidani A. Efficacy of oral zinc and nicotinamide as maintenance therapy for mild/moderate hidradenitis suppurativa: A controlled retrospective clinical study. J Am Acad Dermatol 2020;83:665-7.
203. Fabbrocini G, Marasca C, Luciano MA, Guarino M, Poggi S, Fontanella G , Cacciapuoti S. Vitamin D deficiency and hidradenitis suppurativa: the impact on clinical severity and therapeutic responsivity. J Dermatolog Treat 2021;32:843-4.
204. Guillet A, Brocard A, Bach Ngohou K, Graveline N, Leloup AG, Ali D et al. Verneuil's disease, innate immunity and vitamin D: a pilot study. J Eur Acad Dermatol Venereol 2015;29:1347-53.
205. Caposiena Caro RD, Cannizzaro MV, Botti E, Di Raimondo C, Di Matteo E, Gaziano R , Bianchi L. Clindamycin versus clindamycin plus rifampicin in hidradenitis suppurativa treatment: Clinical and ultrasound observations. J Am Acad Dermatol 2019;80:1314-21.
206. Rosi E, Pescitelli L, Ricceri F, Di Cesare A, Novelli A, Pimpinelli N , Prignano F. Clindamycin as unique antibiotic choice in Hidradenitis Suppurativa. Dermatol Ther 2019;32:e12792.
207. An JH, Moon SJ, Shin JU, Kim DH, Yoon MS , Lee HJ. Clindamycin Mono-Therapy of Hidradenitis Suppurativa Patients: A Single-Center Retrospective Study. Ann Dermatol 2021;33:515-21.
208. Kaur MR , Lewis HM. Hidradenitis suppurativa treated with dapsone: A case series of five patients. J Dermatolog Treat 2006;17:211-3.
209. Yazdanyar S, Boer J, Ingvarsson G, Szepietowski JC , Jemec GB. Dapsone therapy for hidradenitis suppurativa: a series of 24 patients. Dermatology 2011;222:342-6.
210. Lopez-Llunell C, Riera-Marti N, Gamissans M , Romani J. Dapsone in hidradenitis suppurativa: A case series of 56 patients. Dermatol Ther 2021;34:e15161.
211. Baroudi B, Bashyam AM, Feldman SR , Pichardo RO. Dapsone to Treat Moderate-to-Severe Hidradenitis Suppurativa: A Retrospective Case-Series. J Drugs Dermatol 2023;22:e12-e6.
212. Delaunay J, Villani AP, Guillem P, Tristan A, Boibieux A , Jullien D. Oral ofloxacin and clindamycin as an alternative to the classic rifampicin-clindamycin in hidradenitis suppurativa: retrospective analysis of 65 patients. Br J Dermatol 2018;178:e15-e6.
213. Join-Lambert O, Coignard H, Jais JP, Guet-Revillet H, Poiree S, Fraitag S et al. Efficacy of rifampin-moxifloxacin-metronidazole combination therapy in hidradenitis suppurativa. Dermatology 2011;222:49-58.
214. Delage M, Jais JP, Lam T, Guet-Revillet H, Ungeheuer MN, Consigny PH et al. Rifampin-moxifloxacin-metronidazole combination therapy for severe Hurley stage 1 hidradenitis suppurativa: prospective short-term trial and 1-year follow-up in 28 consecutive patients. J Am Acad Dermatol 2023;88:94-100.
215. Molinelli E, Sapigni C, D'Agostino GM, Brisigotti V, Rizzetto G, Bobyr I et al. The Effect of Dalbavancin in Moderate to Severe Hidradenitis Suppurativa. Antibiotics (Basel) 2022;11:1573.
216. Jennings L, Hambly R, Hughes R, Moriarty B , Kirby B. Metformin use in hidradenitis suppurativa. J Dermatolog Treat 2020;31:261-3.

217. Verdolini R, Clayton N, Smith A, Alwash N , Mannello B. Metformin for the treatment of hidradenitis suppurativa: a little help along the way. J Eur Acad Dermatol Venereol 2013;27:1101-8.
218. Moussa C, Wadowski L, Price H, Mirea L , O'Haver J. Metformin as Adjunctive Therapy for Pediatric Patients With Hidradenitis Suppurativa. J Drugs Dermatol 2020;19:1231-4.
219. Miller I, Lynggaard CD, Lophaven S, Zachariae C, Dufour DN , Jemec GB. A double-blind placebo-controlled randomized trial of adalimumab in the treatment of hidradenitis suppurativa. Br J Dermatol 2011;165:391-8.
220. Zouboulis CC, Okun MM, Prens EP, Gniadecki R, Foley PA, Lynde C et al. Long-term adalimumab efficacy in patients with moderate-to-severe hidradenitis suppurativa/acne inversa: 3-year results of a phase 3 open-label extension study. J Am Acad Dermatol 2019;80:60-9 e2.
221. Kimball AB, Bechara FG, Badat A, Giamarellos-Bourboulis EJ, Gottlieb AB, Jemec GBE et al. Long-term efficacy and safety of secukinumab in patients with moderate-to-severe hidradenitis suppurativa: week 104 results from the SUNSHINE and SUNRISE extension trial. Br J Dermatol 2025;192:629-40.
222. Flora A, Kozera EK, Jepsen R, Gill K, Xu J , Frew JW. Baseline clinical, hormonal and molecular markers associated with clinical response to IL-23 antagonism in hidradenitis suppurativa: A prospective cohort study. Exp Dermatol 2023;32:869-77.
223. Leslie KS, Tripathi SV, Nguyen TV, Pauli M , Rosenblum MD. An open-label study of anakinra for the treatment of moderate to severe hidradenitis suppurativa. J Am Acad Dermatol 2014;70:243-51.
224. Tzanetakou V, Kanni T, Giatrakou S, Katoulis A, Papadavid E, Netea MG et al. Safety and Efficacy of Anakinra in Severe Hidradenitis Suppurativa: A Randomized Clinical Trial. JAMA Dermatol 2016;152:52-9.
225. Esme P, Botsali A, Akoglu G , Caliskan E. An Anti-Interleukin-17A Monoclonal Antibody, Ixekizumab, in the Treatment of Resistant Hidradenitis Suppurativa: A Case Series. Skin Appendage Disord 2022;8:342-5.
226. Alavi A, Prens EP, Kimball AB, Frew JW, Krueger JG, Mukhopadhyay S et al. Proof-of-concept study exploring the effect of spesolimab in patients with moderate-to-severe hidradenitis suppurativa: a randomized double-blind placebo-controlled clinical trial. Br J Dermatol 2024;191:508-18.
227. Valenzuela-Ubina S, Jimenez-Gallo D, Villegas-Romero I, Rodriguez-Mateos ME , Linares-Barrios M. Effectiveness of ustekinumab for moderate-to-severe hidradenitis suppurativa: a case series. J Dermatolog Treat 2022;33:1159-62.
228. Sanchez-Martinez EM, Garcia-Ruiz R, Moneva-Leniz LM , Mateu-Puchades A. Effectiveness and safety of ustekinumab in patients with hidradenitis suppurativa using intravenous induction. Dermatol Ther 2020;33:e14054.
229. Romani J, Vilarrasa E, Martorell A, Fuertes I, Ciudad C , Molina-Leyva A. Ustekinumab with Intravenous Infusion: Results in Hidradenitis Suppurativa. Dermatology 2020;236:21-4.
230. Montero-Vilchez T, Pozo-Roman T, Sanchez-Velicia L, Vega-Gutierrez J, Arias-Santiago S , Molina-Leyva A. Ustekinumab in the treatment of patients with hidradenitis suppurativa: multicenter case series and systematic review. J Dermatolog Treat 2022;33:348-53.

231. Jiang SW, Kwock JT, Liu B, Petty AJ, Zhao AT, Green CL , Jaleel T. High-dose, high-frequency ustekinumab therapy for patients with severe hidradenitis suppurativa. Br J Dermatol 2022;187:417-9.
232. Hollywood A, Murray G, Fleming S, Kirby B , Hughes R. Ustekinumab in the Management of Hidradenitis Suppurativa: A Retrospective Study. J Drugs Dermatol 2022;21:319-20.
233. Blok JL, Li K, Brodmerkel C, Horvatovich P, Jonkman MF , Horvath B. Ustekinumab in hidradenitis suppurativa: clinical results and a search for potential biomarkers in serum. Br J Dermatol 2016;174:839-46.
234. Kennedy NA, Heap GA, Green HD, Hamilton B, Bewshea C, Walker GJ et al. Predictors of anti-TNF treatment failure in anti-TNF-naive patients with active luminal Crohn's disease: a prospective, multicentre, cohort study. Lancet Gastroenterol Hepatol 2019;4:341-53.
235. Ducourau E, Rispens T, Samain M, Dernis E, Le Guilchard F, Andras L et al. Methotrexate effect on immunogenicity and long-term maintenance of adalimumab in axial spondyloarthritis: a multicentric randomised trial. RMD Open 2020;6.
236. Roblin X, Williet N, Boschetti G, Phelip JM, Del Tedesco E, Berger AE et al. Addition of azathioprine to the switch of anti-TNF in patients with IBD in clinical relapse with undetectable anti-TNF trough levels and antidrug antibodies: a prospective randomised trial. Gut 2020;69:1206-12.
237. Colombel JF, Sandborn WJ, Reinisch W, Mantzaris GJ, Kornbluth A, Rachmilewitz D et al. Infliximab, azathioprine, or combination therapy for Crohn's disease. N Engl J Med 2010;362:1383-95.
238. van der Zee HH , Prens EP. The anti-inflammatory drug colchicine lacks efficacy in hidradenitis suppurativa. Dermatology 2011;223:169-73.
239. Liakou AI, Kontochristopoulos G, Agiasofitou E, Tsantes AG, Papadakis M, Marnelakis I et al. Colchicine Improves Clinical Outcomes and Quality of Life in Hidradenitis Suppurativa Patients: A Retrospective Study. J Clin Med 2021;10:4742.
240. Armyra K, Kouris A, Markantoni V, Katsambas A , Kontochristopoulos G. Hidradenitis suppurativa treated with tetracycline in combination with colchicine: a prospective series of 20 patients. Int J Dermatol 2017;56:346-50.
241. Anderson MD, Zauli S, Bettoli V, Boer J , Jemec GB. Cyclosporine treatment of severe Hidradenitis suppurativa--A case series. J Dermatolog Treat 2016;27:247-50.
242. Brant EG , Akilov O. Hydroxychloroquine for the treatment of hidradenitis suppurativa. JAAD Case Rep 2023;37:64-7.
243. Weber P, Seyed Jafari SM, Yawalkar N , Hunger RE. Apremilast in the treatment of moderate to severe hidradenitis suppurativa: A case series of 9 patients. J Am Acad Dermatol 2017;76:1189-91.
244. Kerdel FR, Azevedo FA, Kerdel Don C, Don FA, Fabbrocini G , Kerdel FA. Apremilast for the Treatment of Mild-to-Moderate Hidradenitis Suppurativa in a Prospective, Open-Label, Phase 2 Study. J Drugs Dermatol 2019;18:170-6.
245. Vossen A, van Doorn MBA, van der Zee HH , Prens EP. Apremilast for moderate hidradenitis suppurativa: Results of a randomized controlled trial. J Am Acad Dermatol 2019;80:80-8.

246. Kimball AB, Peeva E, Forman S, Moiin A, Khattri S, Porter ML et al. Brepocitinib, Zimlovisertib, and Ropsacitinib in Hidradenitis Suppurativa. NEJM Evid 2024;3:EVIDoa2300155.
247. Bui H, Bechara FG, George R, Goldberg S, Hamzavi I, Kirby JS et al. Surgical Procedural Definitions for Hidradenitis Suppurativa Developed by Expert Delphi Consensus. JAMA Dermatol 2023;159:441-7.
248. Mikkelsen PR, Dufour DN, Zarchi K , Jemec GB. Recurrence rate and patient satisfaction of CO2 laser evaporation of lesions in patients with hidradenitis suppurativa: a retrospective study. Dermatol Surg 2015;41:255-60.
249. Bohn J , Svensson H. Surgical treatment of hidradenitis suppurativa. Scand J Plast Reconstr Surg Hand Surg 2001;35:305-9.
250. Yildiz H, Senol L, Ercan E, Bilgili ME , Karabudak Abuaf O. A prospective randomized controlled trial assessing the efficacy of adjunctive hyperbaric oxygen therapy in the treatment of hidradenitis suppurativa. Int J Dermatol 2016;55:232-7.
251. Zeligman I. Temporary x-ray epilation therapy of chronic axillary hidradenitis suppurativa. Arch Dermatol 1965;92:690-4.
252. Steiner K , Grayson LD. Hidradenitis suppurativa of the adult and its management. AMA Arch Derm 1955;71:205-11.
253. Schenck SG. Hidradenitis suppurativa axillaris; an analysis of 54 cases treated with roentgen rays. Radiology 1950;54:74-7, illust.
254. Patel SH. Radiation Therapy for Chronic Hidradenitis Suppurativa. J Nucl Med Radiat Ther 2013;04.
255. Molina-Leyva A, Salvador-Rodriguez L, Martinez-Lopez A , Cuenca-Barrales C. Effectiveness, safety and tolerability of drainage and punch-trocar-assisted cryoinsufflation (cryopunch) in the treatment of inflammatory acute fluid collections in hidradenitis suppurativa patients. J Eur Acad Dermatol Venereol 2019;33:e221-e3.
256. Dell'Antonia M, Anedda J, Tatti A, Falco A, Sanna S, Ferreli C , Atzori L. Non-surgical treatment of hidradenitis suppurativa: the role of cryotherapy. Front Med (Lausanne) 2023;10:1141691.
257. Bong JL, Shalders K , Saihan E. Treatment of persistent painful nodules of hidradenitis suppurativa with cryotherapy. Clin Exp Dermatol 2003;28:241-4.
258. Lyons A, Narla S, Kohli I, Zubair R, Jacobsen G, Ceresnie M et al. Safety and Efficacy of Intense Pulsed Light With Radiofrequency in United States Hidradenitis Suppurativa Patients. J Drugs Dermatol 2022;21:430-2.
259. Wilden S, Friis M, Tuettenberg A, Staubach-Renz P, Wegner J, Grabbe S , von Stebut E. Combined treatment of hidradenitis suppurativa with intense pulsed light (IPL) and radiofrequency (RF). J Dermatolog Treat 2021;32:530-7.
260. Andersen PL, Riis PT, Thorlacius L, Sigsgaard V, Nielsen CW, Chafranska L et al. [Intense pulsed light treatment for hidradenitis suppurativa: a within-person randomized controlled trial]. Eur J Dermatol 2020;30:723-9.
261. Theut Riis P, Saunte DM, Sigsgaard V, Wilken C , Jemec GBE. Intense pulsed light treatment for patients with hidradenitis suppurativa: beware treatment with resorcinol. J Dermatolog Treat 2018;29:385-7.

262. Strobel A, Schultheis M, Staubach P, Grabbe S, Hennig K, Szepietowski J et al. LAight Therapy is an Effective and Gentle Treatment in Adolescents Suffering from Hidradenitis Suppurative: Results from 96 Patients Using Real-world Data. Acta Derm Venereol 2025;105:adv43543.
263. Behrangi E, Atefi N, Mireshghollah P, Goodarzi A, Dehghani A, Zare Dehnavi A et al. The efficacy and safety of endo-radiofrequency for the treatment of hidradenitis suppurativa. Skin Res Technol 2023;29:e13450.
264. Yang JH, Cho SI, Kim DH, Yoon JY, Moon J, Kim JW et al. Pilot study of fractional microneedling radiofrequency for hidradenitis suppurativa assessed by clinical response and histology. Clin Exp Dermatol 2022;47:335-42.
265. Vossen A, van Huijkelom M, Nijsten TEC, Bakker EWP, van der Zee HH, van Doorn MBA , Prens EP. Aggravation of mild axillary hidradenitis suppurativa by microwave ablation: Results of a randomized intrapatient-controlled trial. J Am Acad Dermatol 2019;80:777-9.
266. Sotiriou E, Apalla Z, Maliamani F , Ioannides D. Treatment of recalcitrant hidradenitis suppurativa with photodynamic therapy: report of five cases. Clin Exp Dermatol 2009;34:e235-6.
267. Schweiger ES, Riddle CC , Aires DJ. Treatment of hidradenitis suppurativa by photodynamic therapy with aminolevulinic acid: preliminary results. J Drugs Dermatol 2011;10:381-6.
268. Calzavara-Pinton PG, Rossi MT, Aronson E, Sala R , Italian Group For Photodynamic T. A retrospective analysis of real-life practice of off-label photodynamic therapy using methyl aminolevulinate (MAL-PDT) in 20 Italian dermatology departments. Part 1: inflammatory and aesthetic indications. Photochem Photobiol Sci 2013;12:148-57.
269. Andino Navarrete R, Hasson Nisis A , Parra Cares J. Effectiveness of 5-aminolevulinic acid photodynamic therapy in the treatment of hidradenitis suppurativa: a report of 5 cases. Actas Dermosifiliogr 2014;105:614-7.
270. Valladares-Narganes LM, Rodriguez-Prieto MA, Blanco-Suarez MD, Rodriguez-Lage C , Garcia-Doval I. Treatment of hidradenitis suppurativa with intralesional photodynamic therapy using a laser diode attached to an optical cable: a promising new approach. Br J Dermatol 2015;172:1136-9.
271. Suarez Valladares MJ, Eiris Salvado N , Rodriguez Prieto MA. Treatment of hidradenitis suppurativa with intralesional photodynamic therapy with 5-aminolevulinic acid and 630nm laser beam. J Dermatol Sci 2017;85:241-6.
272. Gamissans M, Riera-Martí N, Romaní J , Gilaberte Y. Ultrasound-guided photodynamic therapy with intralesional methylene blue and a 635 nm light-emitting diode lamp in hidradenitis suppurativa: A retrospective study of 41 patients. Photodermatol Photoimmunol Photomed 2022;38:12-8.
273. Agut-Busquet E, Romani J, Gilaberte Y, Garcia-Malinis A, Ribera-Pibernat M , Luelmo J. Photodynamic therapy with intralesional methylene blue and a 635 nm light-emitting diode lamp in hidradenitis suppurativa: a retrospective follow-up study in 7 patients and a review of the literature. Photochem Photobiol Sci 2016;15:1020-8.
274. Rosi E, Prignano F, Viola S, Venturini M, Pimpinelli N , Calzavara-Pinton P. Assessment of therapeutic response to photodynamic therapy with the Zn-Phthalocyanine

RLP068/Cl versus topical Clindamycin in patients affected by Hidradenitis Suppurativa: a comparative clinical pilot study. Photochem Photobiol Sci 2024;23:2123-32.
275. Porter ML, Salian P, Rosales Santillan M, Greif C , Kimball AB. An Open-Label, Prospective, Pilot Study of Hypertonic Saline for Hidradenitis Suppurativa. Dermatol Surg 2022;48:954-60.
276. Buimer MG, Ankersmit MF, Wobbes T , Klinkenbijl JH. Surgical treatment of hidradenitis suppurativa with gentamicin sulfate: a prospective randomized study. Dermatol Surg 2008;34:224-7.
277. Michelucci A, Janowska A, Granieri G, Margiotta FM, Morganti R, Romanelli M , Dini V. Advanced wound management approaches in Hidradenitis Suppurativa postsurgical lesions. Health Sci Rep 2023;6:e1582.
278. Grimstad O. Single use negative-pressure wound therapy compared to standard care in patients after carbon dioxide laser surgery for hidradenitis suppurativa. Dermatol Ther 2022;35:e15483.
279. Madueke M , Lau F. Synthetic Electrospun Fiber Matrix in the Management of Acute Wounds Following Excision of Hidradenitis Suppurativa Lesions: A Prospective Pilot Study. Polymers (Basel) 2025;17.
280. Garg A, Neuren E, Cha D, Kirby JS, Ingram JR, Jemec GBE et al. Evaluating patients' unmet needs in hidradenitis suppurativa: Results from the Global Survey Of Impact and Healthcare Needs (VOICE) Project. J Am Acad Dermatol 2020;82:366-76.
281. Orenstein LAV, Salame N, Siira MR, Urbanski M, Flowers NI, Echuri H et al. Pain experiences among those living with hidradenitis suppurativa: a qualitative study. Br J Dermatol 2023;188:41-51.
282. Li Y, Speck P, Viera E, Siira M , Orenstein LAV. The Influence of Pain on Reduced Quality of Life in Patients with Hidradenitis Suppurativa: A Single-Center Retrospective Study. Dermatology 2023;239:1007-12.
283. Matusiak L, Bieniek A , Szepietowski JC. Psychophysical aspects of hidradenitis suppurativa. Acta Derm Venereol 2010;90:264-8.
284. Patel ZS, Hoffman LK, Buse DC, Grinberg AS, Afifi L, Cohen SR et al. Pain, Psychological Comorbidities, Disability, and Impaired Quality of Life in Hidradenitis Suppurativa [corrected]. Curr Pain Headache Rep 2017;21:49.
285. Jedrzejczak MJ, Ingram JR, Lowes MA, Naik HB, McKenzie-Brown AM, Chen SC , Orenstein LAV. Expert Knowledge, Attitudes, and Practices in Management of Hidradenitis Suppurativa Pain. JAMA Dermatol 2021;157:464-6.
286. Tan G, Jensen MP, Thornby JI , Shanti BF. Validation of the Brief Pain Inventory for chronic nonmalignant pain. J Pain 2004;5:133-7.
287. Von Korff M, DeBar LL, Krebs EE, Kerns RD, Deyo RA , Keefe FJ. Graded chronic pain scale revised: mild, bothersome, and high-impact chronic pain. Pain 2020;161:651-61.
288. Freynhagen R, Baron R, Gockel U , Tolle TR. painDETECT: a new screening questionnaire to identify neuropathic components in patients with back pain. Curr Med Res Opin 2006;22:1911-20.
289. Garcovich S, Muratori S, Moltrasio C, Buscemi AA, Giovanardi G, Malvaso D et al. Prevalence of Neuropathic Pain and Related Characteristics in Hidradenitis Suppurativa: A Cross-Sectional Study. J Clin Med 2020;9.

290. Speck PJ, Alsouhibani A, Mustin DE, Cole EF, Harper DE , Orenstein LAV. Correlation between PainDETECT Questionnaire and Quantitative Sensory Testing for the Detection of Neuropathic Pain in Hidradenitis Suppurativa. Dermatology 2024;240:152-5.
291. Aarts P, Aitken JJ , van Straalen KR. Prevalence of Central Sensitization in Patients With Hidradenitis Suppurativa. JAMA Dermatol 2021;157:1209-12.
292. Neblett R, Hartzell MM, Cohen H, Mayer TG, Williams M, Choi Y , Gatchel RJ. Ability of the central sensitization inventory to identify central sensitivity syndromes in an outpatient chronic pain sample. Clin J Pain 2015;31:323-32.
293. Li YH, Speck P, Ingram JR , Orenstein LAV. Comparing maximum and average numerical rating scale pain scores in hidradenitis suppurativa. Arch Dermatol Res 2025;317:496.
294. Lovejoy TI, Turk DC , Morasco BJ. Evaluation of the psychometric properties of the revised short-form McGill Pain Questionnaire. J Pain 2012;13:1250-7.
295. Sow Y, Salame N, Siira MR, Flowers N, Garg A, Patzer RE et al. Healthcare experiences among patients with hidradenitis suppurativa: a qualitative study. Br J Dermatol 2023;189:624-6.
296. Huang CM , Kirchhof MG. Hidradenitis Suppurativa From a Patient Perspective Including Symptoms and Self-Treatment. J Cutan Med Surg 2021;25:591-7.
297. Taylor MT, Orenstein LAV , Barbieri JS. Pain Severity and Management of Hidradenitis Suppurativa at US Emergency Department Visits. JAMA Dermatol 2021;157:115-7.
298. Ring HC, Theut Riis P, Miller IM, Saunte DM , Jemec GB. Self-reported pain management in hidradenitis suppurativa. Br J Dermatol 2016;174:909-11.
299. Huang C, Keller M , Yang S. Pain Self-Management Strategies for Hidradenitis Suppurativa Patients: An In-Person Survey Study. J Cutan Med Surg 2025;29:259-62.
300. Fernandez JM, Thompson AM, Borgstrom M, Orenstein LAV, Hsiao JL , Shi VY. Pain management modalities for hidradenitis suppurativa: a patient survey. J Dermatolog Treat 2022;33:1742-5.
301. Ravn Jorgensen AH, Yao Y, Thomsen SF , Christian Ring H. Self-Reported Pain Alleviating Methods in Patients with Hidradenitis Suppurativa. Actas Dermosifiliogr (Engl Ed) 2021;112:153-8.
302. Savage KT, Singh V, Patel ZS, Yannuzzi CA, McKenzie-Brown AM, Lowes MA , Orenstein LAV. Pain management in hidradenitis suppurativa and a proposed treatment algorithm. J Am Acad Dermatol 2021;85:187-99.
303. Horvath B, Janse IC , Sibbald GR. Pain management in patients with hidradenitis suppurativa. J Am Acad Dermatol 2015;73:S47-51.
304. Li YH, Williams MN, Jedrzejczak MJ, Orenstein LAV , Singh V. A practical, comprehensive guide to pain management hidradenitis suppurativa. Dermatological Reviews 2022;3:137-49.
305. Soltoff A, Gold S, Echuri H, Curseen K, Soodalter J, Kavalieratos D , Orenstein L. Empathy, expertise, and expeditious communication: identifying how people with hidradenitis suppurativa experience outpatient palliative care. Arch Dermatol Res 2025;317:687.

306. Force USPST, Krist AH, Davidson KW, Mangione CM, Barry MJ, Cabana M et al. Interventions for Tobacco Smoking Cessation in Adults, Including Pregnant Persons: US Preventive Services Task Force Recommendation Statement. JAMA 2021;325:265-79.
307. Verde L, Cacciapuoti S, Caiazzo G, Megna M, Martora F, Cavaliere A et al. Very low-calorie ketogenic diet (VLCKD) in the management of hidradenitis suppurativa (Acne Inversa): an effective and safe tool for improvement of the clinical severity of disease. Results of a pilot study. J Transl Med 2024;22:149.
308. Nicolau J, Nadal A, Sanchis P, Pujol A, Masmiquel L , Nadal C. Liraglutide for the treatment of obesity among patients with hidradenitis suppurativa. Med Clin (Barc) 2024;162:118-22.
309. Lyons D, Louly Nathan A, Pender E, Murray G, Smith C, Kirby B , Hughes R. Semaglutide for weight loss in people with obesity as an adjunctive treatment for hidradenitis suppurativa: its impact on disease control and quality of life. Br J Dermatol 2024;191:631-3.
310. Canard C, Diaz Cives A, Gaubil-Kaladjian I, Bertin E , Viguier M. Impact of Bariatric Surgery on Hidradenitis Suppurativa. Acta Derm Venereol 2021;101:adv00471.
311. Posada Posada MI, Alora MB , Lima XTV. Impact of semaglutide use in obese and diabetic patients with hidradenitis suppurativa. J Eur Acad Dermatol Venereol 2025;39:e662-e4.
312. Acosta-Madiedo AS, Gutierrez M, Gutierrez M, Villacampa A , Kerdel F. An Open-Label, Single-Center Proof of Concept Study Evaluating the Efficacy and Safety of Tirzepatide for Moderate to Severe Hidradenitis Suppurativa. J Drugs Dermatol 2025;24:1246-51.
313. Gouvrion L, Delage M, Villani AP, Le Naour S, Fite C, Cassius C et al. Glucagon-Like Peptide-1 Receptor Agonists in Hidradenitis Suppurativa. JAMA Dermatol 2025;161:1084-6.
314. Islam Z, Karpoff K, Alicea DS, Wong JH, Wu S, Lu A et al. Glucagon-Like Peptide-1 Receptor Agonists Are Associated With Reduced Disease Severity and Pain in Hidradenitis Suppurativa: A Retrospective Study. Int J Dermatol 2025.
315. Kromann CB, Ibler KS, Kristiansen VB , Jemec GB. The influence of body weight on the prevalence and severity of hidradenitis suppurativa. Acta Derm Venereol 2014;94:553-7.
316. Damiani G, Mahroum N, Pigatto PDM, Pacifico A, Malagoli P, Tiodorovic D et al. The Safety and Impact of a Model of Intermittent, Time-Restricted Circadian Fasting ("Ramadan Fasting") on Hidradenitis Suppurativa: Insights from a Multicenter, Observational, Cross-Over, Pilot, Exploratory Study. Nutrients 2019;11:1781.
317. Velluzzi F, Anedda J, Pisanu S, Dell'Antonia M, Deledda A, Boi A et al. Mediterranean diet, lifestyle and quality of life in Sardinian patients affected with Hidradenitis suppurativa. J Public Health Res 2021;11:2706.
318. Lorite-Fuentes I, Montero-Vilchez T, Arias-Santiago S , Molina-Leyva A. Potential Benefits of the Mediterranean Diet and Physical Activity in Patients with Hidradenitis Suppurativa: A Cross-Sectional Study in a Spanish Population. Nutrients 2022;14:551.
319. Bouwman K, Moazzen S, Kroah-Hartman M, Dijkstra G, Horvath B , Alizadeh BZ. Diet and physical activity as risk-reducing factors for hidradenitis suppurativa. J Eur Acad Dermatol Venereol 2024;38:910-9.

320. Barrea L, Fabbrocini G, Annunziata G, Muscogiuri G, Donnarumma M, Marasca C et al. Role of Nutrition and Adherence to the Mediterranean Diet in the Multidisciplinary Approach of Hidradenitis Suppurativa: Evaluation of Nutritional Status and Its Association with Severity of Disease. Nutrients 2018;11:57.
321. Kesik F, Dogan-Gunaydin S , Fisunoglu M. The Impact of Diet on Hidradenitis Suppurativa Severity: A Cross-Sectional Case-Control Study. Medicina (Kaunas) 2024;60.
322. Colboc H, Fite C, Cannistra C, Chaby G, Maillard H, Bouscarat F et al. Interest of brewer's yeast-exclusion diet in the management of hidradenitis suppurativa. Journal of Clinical & Experimental Dermatology Research 2016;7:371.
323. Cannistra C, Finocchi V, Trivisonno A , Tambasco D. New perspectives in the treatment of hidradenitis suppurativa: surgery and brewer's yeast-exclusion diet. Surgery 2013;154:1126-30.
324. Aboud C, Zamaria N , Cannistra C. Treatment of hidradenitis suppurativa: Surgery and yeast (Saccharomyces cerevisiae)-exclusion diet. Results after 6 years. Surgery 2020;167:1012-5.
325. Kurzen H , Kurzen M. Secondary prevention of hidradenitis suppurativa. Dermatol Reports 2019;11:8243.
326. Danby FW. Diet in the prevention of hidradenitis suppurativa (acne inversa). J Am Acad Dermatol 2015;73:S52-4.
327. Donnarumma M, Marasca C, Palma M, Vastarella M, Annunziata MC , Fabbrocini G. An oral supplementation based on myo-inositol, folic acid and liposomal magnesium may act synergistically with antibiotic therapy and can improve metabolic profile in patients affected by Hidradenitis suppurativa: our experience. G Ital Dermatol Venereol 2020;155:749-53.
328. Angel MF, Ramasastry SS, Manders EK, Granfield D , Futress JW. Beneficial effects of staphage lysate in the treatment of chronic recurrent hidradenitis suppurativa. Surgical Forum 1987:111-2.
329. Bagaruka E, Marchbanks J, Hemmerich C, Howard H, Jones G, Babek JT et al. Diversity in U.S. hidradenitis suppurativa clinical trials: systematic review and meta-analysis. Archives of Dermatological Research 2025;318:25.
330. Choi J, Rookwood R, Yoon I, Campton K , Kobets K. Disparities in Hidradentitis Suppurativa Clinical Trials: An Updated Review of ClinicalTrials.gov from 2020 to 2024. J Drugs Dermatol 2025;24:1203-7.
331. Alhusayen R, Dienes S, Lam M, Alavi A, Alikhan A, Aleshin M et al. North American clinical practice guidelines for the medical management of hidradenitis suppurativa in special patient populations. J Am Acad Dermatol 2025;92:825-52.

Table IV. Medication dosing for hidradenitis suppurativa.

	Topical therapies			Systemic antibiotics			
	Clindamycin	Resorcinol	Ruxolitinib	Doxycycline	Tetracycline	Clindamycin and rifampin	Ertapenem
Recommendation	Conditional	Conditional	Conditional	Conditional	Conditional	Conditional	Conditional
Dose	1% lotion, gel or solution BID to affected skin	OTC, requires compounding; 10-15% cream daily to BID to affected skin	1.5% cream BID to affected skin	100mg PO BID for 12 weeks	500mg PO BID for 12 weeks	Both 300mg PO BID for 12 weeks	1g IV daily for 6 weeks
Monitoring	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Selection of most relevant adverse effects	Skin burning, itching, dryness, erythema, peeling	Skin desquamation, discoloration, irritation	URI, acne, application site reaction, fever, decreased white blood cell	GI symptoms, transaminitis, photosensitivity	GI symptoms, skin irritation, photosensitivity	GI symptoms, *C. difficile colitis*, CYP450 inducer	PICC infection, PICC thrombosis, adhesive dermatitis, vaginal candidiasis, transaminitis, infusion reaction, *C. difficile colitis*

GI, gastrointestinal; PICC, peripherally inserted central catheter; Q2W, every 2 weeks; Q4W, every 4 weeks; URI, upper respiratory infection

	Hormonal therapy	Monoclonal antibodies (biologics)				Immunosuppressant / small molecule inhibitor	
	Spironolactone	Adalimumab	Bimekizumab	Infliximab	Secukinumab	Prednisone	Upadacitinib
Recommendation	Conditional	Strong	Strong	Strong	Strong	Conditional	Conditional
Dose	50mg-200mg PO daily	*Adults or adolescents ≥12 years & ≥60 kg:* Loading dose: 160mg SC on day 1 or 80mg each on day 1 and day 2, 80mg SC on day 15 Maintenance dose: 40mg SC weekly or 80mg SC Q2W from day 29 onward *Adolescents ≥12 years 30kg to <60kg*: 80mg SC on day 1,	*Adults: 3* <u>*Loading dose:*</u> 20mg SC Q2W from weeks 0 to 16 <u>*Maintenance dose:*</u> Q4W thereafter	<u>Loading dose:</u> 5-10mg/kg IV at week 0, 2 and 6 <u>Maintenance dose:</u> every 4-8 weeks thereafter	*Adults:* <u>*Loading dose:*</u> 300mg SC weekly from weeks 0 to 4 <u>*Maintenance dose*</u>: Q4W thereafter. May escalate to Q2W for adequate response	40-60mg PO daily with taper over 1-2 weeks	Adults and adolescents age 12-64: 30mg PO daily; adults age≥65: 15mg PO daily

		then 40mg Q2W from day 8 onward					
Monitoring	Serum potassium and creatinine in renally-impaired patients	CBC, renal and hepatic profile, tuberculosis, hepatitis B and C, and HIV screen				N/A	CBC, lipid profile, hepatic profile, tuberculosis, and hepatitis B and C screening
Selection of most relevant adverse effects	GI symptoms, breast tenderness, changes in urination, gynecomastia, teratogenicity	Serious infections, malignancy	URI, candidiasis, headache, tinea infection suicidal ideation and behaviors, serious infections, inflammatory bowel disease, transaminitis .	Serious infections, malignancy, infusion reaction	Headache, URI, candidiasis, fungal infections, hypersensitivity . serious infections, inflammatory bowel disease, severe eczema	Diabetes mellitus, cataracts, glaucoma, hypertension , serious infection, osteoporosis	headache, dizziness, urinary tract infection, serious infections, malignancy, major adverse cardiovascular events, thrombosis, higher rates of all-cause mortality.

Workgroup Members' Disclosures

The information below represents the authors' disclosed relationship with industry during guideline development. Authors (listed alphabetically) with relevant conflicts with respect to this guideline are noted with an asterisk*.

Participation in one or more of the listed activities below constitutes a relevant conflict:

- service as a member of a speaker bureau, consultant, advisory board, for pharmaceutical companies on hidradenitis suppurativa (HS) or HS drugs in development or FDA-approved.
- sponsored research funding or investigator-initiated studies with partial/full funding from pharmaceutical companies on HS or HS drugs in development or FDA-approved

If a potential conflict was noted, the workgroup member recused themselves from the discussion and drafting of recommendations pertinent to the topic area of interest. Complete group consensus was obtained for draft recommendations. Areas where complete consensus was not achieved are shown transparently in the guideline.

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