Table S1

ATTRIBUTION OF DERMATOLOGIC SYNDROME TO ICI THERAPY
Timing and tempo: [REVISED STATEMENT] To be considered a D-irAE, symptoms must begin within 12 months of last infusion of the ICI therapy. Most D-irAEs, however, occur within 12 weeks of starting a new ICI. New onset D-irAEs beyond 6 months of starting a therapy are less common.
Exclusion of other etiologies: The diagnosis of all D-irAEs requires that other potential etiologies have been excluded by a workup tailored to each patient. A careful history, baseline dermatologic exam, and ancillary data can help exclude or confirm pre-ICI dermatologic disease. Patients with known dermatologic disorders, particularly immune-mediated dermatologic conditions, are recommended to have a dermatologic examination prior to starting ICI therapy and be under a dermatologist's or dermatology subspecialist's care during ICI therapy, depending on the complexity of the patient's dermatologic illness.
Consideration of concurrent irAEs: Patients frequently have irAEs affecting multiple organ systems. The presence of a concurrent non-dermatologic irAE can be a clue that dermatologic symptoms represent an irAE. A dermatologic irAE can also prompt evaluation of other organ systems when known patterns of overlapping disease exist (i.e., dermatomyositis).
Improvement upon holding drug and/or initiating corticosteroids: [REVISED STATEMENT] While not necessarily first line treatment, holding ICI therapy or initiating topical or systemic corticosteroids usually leads to improvement of D-irAEs. Lack of improvement, particularly after several weeks of treatment with topical or systemic corticosteroids or another irAE therapy, should prompt re-consideration of the D-irAE classification and diagnosis.

Table S2

GENERAL GUIDANCE STATEMENTS
Autoantibodies: Some irAEs are associated with pathophysiologic antibodies. These antibodies may be known prior to ICI administration or be detected during evaluation of an D-irAE. These definitions do not distinguish whether there is an antibody present or not; they have instead been constructed to include criteria that ensure a relationship with immunotherapy such as onset after ICI and improvement with ICI cessation. Even if a patient has a known antibody prior to immunotherapy administration, the temporal association of irAE with an ICI suggests that the immunotherapy has contributed in some part to these symptoms. When naming a D-irAE in a patient with a known antibody, we recommend including the antibody as part of the diagnosis (for example, “Definite immune related bullous pemphigoid with BPAG 180 antibody” or “probable immune related bullous pemphigoid with positive 230 antibody”). Patients may additionally have abnormal antibodies after ICI therapy that are typically low titer. As many of these antibodies are non-specific and may be unrelated, a patient’s syndrome should be referenced back to known antibody syndromes before establishing a diagnosis with a given antibody.
Paraneoplastic Syndromes: Patients may have paraneoplastic syndromes exacerbated or triggered by ICI therapy. The distinction between a process that is driven by an underlying cancer and a process that is an irAE can have significant, often opposing, treatment implications. Like the approach to autoantibodies, these definitions have been constructed to include criteria that ensure a relationship with ICIs such as improvement after stopping the ICI. A patient may therefore initially have a “Possible” or “Probable” diagnosis before it becomes “Definite” or an alternate diagnosis. The clinical decision for how to treat a patient is beyond the scope of these guidelines but will typically benefit from multidisciplinary collaboration.
Clinical Trial Adjudication: Use of consensus criteria to define D-irAEs may standardize reporting, allowing for data pooling and cross-trial comparisons. To facilitate use of these definitions, it may be beneficial to have a centralized data safety monitoring capacity to classify D-irAEs according to consensus criteria in clinical trials. Source documents collection for D-irAE adjudication is outlined in the table below. For overlapping syndromes, source documentation recommendations are followed for each individual toxicity.

Table S3:

ICI-PRURITUS WITHOUT RASH	
SUBTYPES	**SYMPTOMS**
• Localized • Generalized	• Itch or burning • Interference with sleep and other ADLs can occur
	SUPPORTIVE EXAM FINDINGS
	• No primary rash should be apparent on dermatologic examination. • Secondary change from a patient's scratching (e.g., erosions from excoriation or in severe cases, prurigo nodules) can be seen.

ICI-PRURITUS WITHOUT RASH WORKUP: Workup of ICI-DTH follows standard D-irAE, as previously shown.

Table S4:

ICI-PRURITUS WITHOUT RASH DIAGNOSTIC CRITERIA
DEFINITE **Required:** 1. BCD or non-BCD diagnosed ICI-Pruritus with no apparent skin eruption on full skin exam **AND** 2. Completely negative workup (lack of: BP antibody, eosinophilia, elevated IgE).
PROBABLE **Required:** 1. BCD or non-BCD diagnosed ICI-Pruritus with no apparent skin eruption on full skin exam **AND** 2. Limited findings on workup (may only have eosinophilia or positive IgE*).
POSSIBLE **Required:** 1. BCD or non-BCD provider diagnosed ICI-Pruritus with no apparent skin eruption on full skin exam. **AND** 2. No workup sent.

*Eosinophilia and elevated IgE are allowable for probable ICI-Pruritus as these findings do not specify a different diagnosis. However, if BP antibody titers are positive or inflammation is seen on biopsy, the patient should be considered for ICI-BP or another D-irAE subtype based on findings and should no longer be considered to have ICI-Pruritus.

Abbreviations: BCD: board-certified dermatologist; BP: bullous pemphigoid; IgE: immunoglobulin E

Table S5:

ICI-VITILIGO
Typical Clinical Exam: Sharply demarcated white (depigmented) macules or patches, which may appear pink after sun exposure. Surrounding skin is typically normal. If affected area is hair bearing, hair may eventually turn white. A Wood's lamp examination may be helpful to distinguish depigmentation from hypopigmentation as the latter is not as pronounced under illumination.
ICI-VITILIGO WORKUP: Workup of ICI-Vitiligo follows standard D-irAE, as above.

Table S6:

ICI-VITILIGO DIAGNOSTIC CRITERIA For all categories, classic exam is defined as: *Sharply demarcated white (depigmented) macules or patches, which may appear pink after sun exposure. Surrounding skin is typically normal. If affected area is hair bearing, hair may eventually turn white.*
DEFINITE **Required:** 1. Classic exam of vitiligo diagnosed by a BCD. **OR** 1. Classic exam of vitiligo diagnosed by non-BCD **AND** 2. Consistent histology: *Absence of melanocytes with basal hypopigmentation (reduced or absent melanin in lesional skin) with occasional presence of inflammatory cells (most commonly on edges of lesion).* **Supportive:** Depigmentation on Wood's lamp examination. Absence of elevation, erythema, purpura, scale, or any textural changes to the skin.
PROBABLE **Required:** 1. Classic exam of vitiligo diagnosed by non-BCD. **OR** 1. Consistent histology. **Supportive:** Depigmentation on Wood's lamp examination. Absence of elevation, erythema, purpura, scale, or any textural changes to the skin.
POSSIBLE **Required:** 1. Consistent histology in the absence of classic exam findings.

Abbreviations: BCD: board-certified dermatologist

Table S7

ICI-LICHEN PLANUS	
SUBTYPES	**SYMPTOMS**
• Hypertrophic • Follicular • Bullous • Ulcerative • Pigmented • Mucosal	• May present with or without significant itch • Lesions may affect all body sites, including mucosal surfaces
	SUPPORTIVE EXAM FINDINGS
	• ***Hypertrophic:*** Thick verrucous plaques that favor the shins. • ***Follicular:*** LP involving hair on the body or scalp. Scalp involvement can cause scarring hair loss known as lichen planopilaris. • ***Bullous:*** Bullous LP occurs as a result of a florid interface dermatitis with subsequent loss of integrity of the basement membrane zone. Here, bullae arise within existing plaques of LP. Lichen planus pemphigoides represents the development of true bullous pemphigoid in a patient with lichen planus: bullae arise in uninvolved skin. • ***Ulcerative:*** A variant that is usually seen on palms and soles. • ***Pigmented:*** A variant that predominantly or entirely consists of hyperpigmented macules, usually seen on the face, arms, and upper torso. • ***Mucosal:*** lacy, netlike, white plaques with a violaceous base on the tongue or buccal mucosa. Painful erosions and ulcers may also be seen, as well as atrophic, bullous, pigmented, and papular forms. Lesions may also be seen on the conjunctivae, the vulva, vagina, glans penis, anus, tonsils, larynx, and throughout the gastrointestinal tract.

ICI-LICHEN PLANUS WORKUP: Workup of ICI-LP follows standard D-irAE, as above.

Table S8

ICI-LICHEN PLANUS DIAGNOSTIC CRITERIA

For all categories, classic exam is defined as: *purple, planar, polygonal, pruritic, papules, and plaques (6 Ps) most commonly seen on the volar wrists and flexural surfaces. Lesions can be widespread, involving trunk, inner thighs, shins, hands, and genitalia. As lesions age, their surfaces develop adherent scales that form fine, grayish-white streaks (Wickham striae). Lesions tend to appear in sites of trauma or friction (Koebner phenomenon).*

DEFINITE

Required (For BCD #1 required); For non-BCD (1, 2 required):

1. Classic exam, diagnosed by a BCD.

OR

1. Classic exam, diagnosed by a non-BCD **AND**
2. Consistent histology: *dense, band-like lymphocytic infiltrate in dermis that obscures dermoepidermal junction, cytoplasmic vacuolization of basal keratinocytes and apoptotic keratinocytes that degenerate into colloid bodies.*

OR

1. Consistent exam of lichen planus variant diagnosed by a BCD: hypertrophic, follicular, bullous, ulcerative, pigmented, mucosal (as previously defined) **AND**
2. Consistent histology.

Supportive: Increased CD163+ cells (macrophage-monocyte lineage) may help differentiate from classic LP. Presence of eosinophils in the infiltrate may also help distinguish lichenoid drug eruption from classic LP. Fissuring, longitudinal ridging, and lateral thinning of the nails can accompany the skin manifestations. Dorsal pterygia may form due to scarring of the underlying nail matrix.

PROBABLE

Required:

1. Classic exam, diagnosed by non-BCD.

OR

1. Consistent exam of LP variant diagnosed by a BCD.

OR

1. Consistent exam of LP variant diagnosed by a non-BCD **AND**
2. Consistent histology.

Supportive: *Increased CD163+ cells (macrophage-monocyte lineage) may help differentiate from classic LP. Presence of eosinophils in the infiltrate may also help distinguish lichenoid drug eruption from classic LP.* Fissuring, longitudinal ridging, and lateral thinning of the nails can accompany the skin manifestations. Dorsal pterygia may form due to scarring of the underlying nail matrix.

POSSIBLE

Required:

1. Consistent histology in the absence of classic exam findings.

Supportive: *Increased CD163+ cells (macrophage-monocyte lineage) may help differentiate from classic LP. Presence of eosinophils in the infiltrate may also help distinguish lichenoid drug eruption from classic LP.* Fissuring, longitudinal ridging, and lateral thinning of the nails can accompany the skin manifestations. Dorsal pterygia may form due to scarring of the underlying nail matrix.

Abbreviations: BCD: board-certified dermatologist; LP: lichen planus

Table S9

ICI-PSORIASIS	
SUBTYPES	**SYMPTOMS**
• Plaque type (psoriasis vulgaris) • Inverse • Guttate • Palmoplantar • Pustular • Erythrodermic	• May present with or without significant itch • May be associated with inflammatory joint symptoms **SUPPORTIVE EXAM FINDINGS** • ***Plaque psoriasis:*** Well demarcated red or pink plaques with silvery/micaceous scale. Favors extensor surfaces, scalp, scars, umbilicus, gluteal cleft. • ***Inverse psoriasis:*** Pink patches in inguinal, axillary, gluteal folds. May cause scaling and plaques on the genitalia. • ***Guttate psoriasis:*** Diffuse, 2-5mm pink or red papules with silvery scale, generally on the trunk or extremities. • ***Palmoplantar psoriasis:*** Erythematous, scaling plaques over the palms and/or soles or significant hyperkeratosis with or without erythema. • ***Pustular psoriasis:*** Patches and plaques of erythema with numerous pustules in areas forming lakes of pus. May present with pustules limited to plaques, in an annular pattern or with sterile pustules and papules on the palms or soles. • ***Erythrodermic psoriasis:*** Diffuse erythema and scaling over 80% BSA, with active or prior plaques in classic locations, consistent nail findings and sparing of face.

ICI-PSORIASIS WORKUP: Workup of ICI-Psoriasis follows standard D-irAE, as previously shown.

Table S10

ICI-PSORIASIS DIAGNOSTIC CRITERIA

For all categories, classic exam of plaque psoriasis is defined as: *Well demarcated red or pink plaques with silvery/micaceous scale. Favors extensor surfaces, scalp, scars, umbilicus, gluteal cleft.*

DEFINITE

Required:

1. Classic exam of a plaque subtype diagnosed by a BCD.

OR

1. Classic exam of a plaque subtype diagnosed by non-BCD, **AND**
2. Consistent histology: Pathologic features vary depending on age of lesion. For stable plaques, not the presence of psoriasiform hyperplasia of the epidermis, parakeratosis, neutrophils in the stratum corneum.

OR

1. Consistent exam of psoriasis variant diagnosed by a BCD*:*
   a. ***Inverse psoriasis:*** Pink patches in inguinal, axillary, gluteal folds. May cause scaling and plaques on the genitalia
   b. ***Guttate psoriasis:*** Diffuse, 2-5mm pink or red papules with silvery scale, generally on the trunk or extremities
   c. ***Palmoplantar psoriasis:*** Erythematous, scaling plaques over the palms and/or soles or significant hyperkeratosis with or without erythema
   d. ***Pustular psoriasis:*** Patches and plaques of erythema with numerous pustules in areas forming lakes of pus. May present with pustules limited to plaques, in an annular pattern or with sterile pustules and papules on the palms or soles
   e. ***Erythrodermic psoriasis:*** Diffuse erythema and scaling over 80% BSA, with active or prior plaques in classic locations, consistent nail findings and sparing of face **AND**
2. Consistent histology.

Supportive:

Nail pitting, oil spotting; seronegative inflammatory arthropathy. May exhibit Koebner phenomenon.

PROBABLE

Required:

1. Classic exam of a plaque subtype diagnosed by non-BCD.

OR

1. Consistent exam of psoriasis variant diagnosed by a BCD.

OR

1. Consistent exam of psoriasis variant diagnosed by a non-BCD, **AND**
2. Consistent histology.

Supportive: Nail pitting, oil spotting; seronegative inflammatory arthropathy. May exhibit Koebner phenomenon.

POSSIBLE

Required:

1. Consistent histology in the absence of classic exam findings.

Supportive: Nail pitting, oil spotting; seronegative inflammatory arthropathy. May exhibit Koebner phenomenon.

Abbreviations: BCD: board-certified dermatologist; BSA: body surface area

Table S11

ICI-EXANTHEM	
SUBTYPES	**SYMPTOMS**
• Morbilliform • Macular erythema	• Usually itch or burning reported; in some cases, can be asymptomatic • Later, can have superficial desquamation
	SUPPORTIVE EXAM FINDINGS
	• ***Morbilliform:*** 3-4 mm erythematous papules that may coalesce into plaques on torso and extremities, less so on face. Most classically begins on the trunk. • ***Macular erythema:*** Geographic erythematous patches or thin scaly erythematous plaques.

ICI-EXANTHEM WORKUP: Workup of ICI-exanthem follows standard D-irAE, as previously shown.

Table S12

ICI-EXANTHEM DIAGNOSTIC CRITERIA
DEFINITE **Required:** 1. BCD diagnosed ICI-exanthem with classic exam (e.g., morbilliform). **OR** 1. BCD diagnosed atypical exam (e.g., macular erythema) **AND** 2. Classic histopathology (superficial and deep perivascular lymphohistiocytic infiltrate) +/- eosinophils. **OR** 1. Non-BCD diagnosed morbilliform eruption (only) **AND** 2. Classic histopathology (superficial and deep perivascular lymphohistiocytic infiltrate) +/- eosinophils.
PROBABLE **Required:** 1. BCD diagnosed ICI-exanthem with atypical exam (e.g., macular erythema). **OR** 1. Non-BCD diagnosed atypical DTH (macular erythema) **AND** 2. Classic histopathology (superficial and deep perivascular lymphohistiocytic infiltrate) +/- eosinophils. **OR** 1. Non-BCD diagnosed morbilliform eruption (only).
POSSIBLE **Required:** 1. Non-BCD diagnosed atypical ICI-exanthem (macular erythema), only.

Abbreviations: BCD: board-certified dermatologist, DTH: delayed type hypersensitivity

ICI-exanthem can precede more severe D-irAEs. If patients who have been diagnosed with ICI-exanthem progress to having systemic symptoms, positive laboratory findings, bullous lesions, or mucosal involvement, attention should be paid to a potential revision in D-irAE diagnosis.

Table S13

ICI-BULLOUS PEMPHIGOID	
SUBTYPES	**SYMPTOMS**
• Classic • Atypical – eczematous • Atypical – pruritus only (no rash) • Atypical – other	• Usually presents and may be preceded with significant pruritus • May be associated with mucosal symptoms/erosions **SUPPORTIVE EXAM FINDINGS** • ***Classic BP:*** Tense vesicles and bullae, open erosions with collarettes of scale, which may involve the oral mucosa in a minority of cases. Some cases may be pre-bullous with urticarial edematous plaques. • ***Atypical - Eczematous:*** Scaly, moist plaques, with collarettes of scale, potential crust from dried serous drainage. • ***Atypical - Pruritus only:*** No clear rash but may have linear plaques from patient excoriation. • ***Atypical - Other:*** Any other type of skin eruption that may meet criteria based on biopsy and lab criteria (see below).
ICI-BULLOUS PEMPHIGOID WORKUP ***In addition to the general workup detailed above for all D-irAEs, the following can be considered for ICI-BP presentation:***	
COMMON: 1. Skin Biopsy (DIF) 2. Bullous Pemphigoid Antibody titers (serum test)	
POSSIBLE: 1. IIF (Salt-split skin)	

Abbreviations: BCD: board-certified dermatologist; DIF: direct immunofluorescence; IIF: indirect immunofluorescence; BP: bullous pemphigoid; Abs: antibodies

Table S14

ICI-BULLOUS PEMPHIGOID DIAGNOSTIC CRITERIA
DEFINITE **Required**: 1. 1 of the following 2: a. Classic exam of tense bullae on erythematous/urticarial plaques, older lesions with erosions with collarettes of scale, diagnosed by BCD or non-BCD **OR** b. Atypical exam of eczematous plaques or pruritus without rash diagnosed as BP by BCD **AND** 2. Classic histology of eosinophilic spongiosis, subepidermal cleft **AND** 3. 1 of the following 3: a. Positive DIF (Linear IgG/C3) b. Positive BP Antibody Titers from serum c. Positive IIF (including salt split with reactivity on roof)
PROBABLE **Required:** **All Definite Criteria except one element (e.g., 1+2, 1+3, 2+3):** 1. Classic exam of tense bullae on erythematous/urticarial plaques, older lesions with erosions with collarettes of scale, diagnosed by BCD **AND** 2. Classic Histology of eosinophilic spongiosis, subepidermal cleft **AND** 3. Without positive DIF, IIF, or BP Abs. **OR** 1. Atypical exam of eczematous plaques or pruritus without rash diagnosed as BP by non-BCD **AND** 2. Classic Histology of eosinophilic spongiosis, subepidermal cleft **AND** 3. 1 of the following 3: a. Positive DIF (Linear IgG/C3) **OR** b. Positive BP Antibody Titers from serum **OR** c. Positive IIF (including salt split with reactivity on roof) **Supportive:** Clinical exams that are atypical but previously reported include: eczematous, urticarial exams.
POSSIBLE **Required:** 1. Atypical exam of eczematous plaques or pruritus without rash diagnosed as BP by BCD, without classic histology or immunologic phenomenon. **OR** 1. Classic exam tense bullae on erythematous/urticarial plaques, older lesions with erosions with collarettes of scale, diagnosed by non-BCD, without classic histology or immunologic phenomenon.

Abbreviations: BCD: board-certified dermatologist; DIF: direct immunofluorescence; IIF: indirect immunofluorescence; BP: bullous pemphigoid; Abs: antibodies; IgG: immunoglobulin G; C3: complement 3

Table S15

ICI-GROVER'S DISEASE	
SUBTYPES	**SYMPTOMS**
• Classic • Atypical – pustular or vesicular	• Usually presents with significant pruritus **SUPPORTIVE EXAM FINDINGS** • ***Classic:*** Discrete red crusted papules distributed on the trunk. Lesions are typically excoriated. Proximal extremities and neck can be affected, but palms, soles, and genitals are spared. • ***Atypical – pustular or vesicular:*** Discrete pustules, papulopustules, or vesicles in similar distribution to above.

ICI-GROVER'S DISEASE WORKUP: Workup of ICI- Grover's disease follows standard D-irAE, as above.

Table S16

ICI-GROVER'S DISEASE DIAGNOSTIC CRITERIA
DEFINITE **Required:** 1. Classic exam of Grover's disease diagnosed by a BCD. **OR** 1. Atypical exam of Grover's disease diagnosed by a BCD **AND** 2. Consistent histology: *Variable as can mimic other acantholytic disorders. Typically, presence of acantholytic dyskeratosis is seen. Acatholysis extent can range from partial to full thickness. Spongiotic pattern with rare acantholysis can also be seen.* **OR** 1. Classic exam of Grover's disease diagnosed by a non-BCD **AND** 2. Consistent histology. **Supportive:** Heat, fever, and sweating can exacerbate the symptoms.
PROBABLE **Required:** 1. Atypical exam diagnosed by a BCD. **OR** 1. Atypical Exam diagnosed by a non-BCD **AND** 2. Consistent histology. **OR** 1. Classic exam of Grover's disease diagnosed by a non-BCD. **Supportive:** Heat, fever, and sweating can exacerbate the symptoms.
POSSIBLE **Required:** 1. Consistent histology in the absence of classic exam findings.

Abbreviations: BCD: board-certified dermatologist; IgG: immunoglobulin G; C3: complement 3

Table S17

ICI-ECZEMATOUS DERMATITIS	
SUBTYPES	**SYMPTOMS**
• Atopic dermatitis-like • Nummular dermatitis • Contact-dermatitis-like • Erythrodermic • Dyshidrosis	• Significant itch is usually present **SUPPORTIVE EXAM FINDINGS** • ***Atopic dermatitis-like:*** Pink scaly patches and plaques, with a predilection for flexor surfaces. • ***Nummular dermatitis:*** Oval and round scaly patches and plaques on the trunk and extremities. • ***Contact-dermatitis-like:*** Pink papules and plaques with geometric configuration. • ***Erythrodermic:*** Scaly macules, patches and plaques affecting >80% BSA. • ***Dyshidrosis:*** Deep seeded vesicles and papules with scale on the palms and soles with predilection for sides of digits.

ICI-ECZEMATOUS DERMATITIS WORKUP: Workup of ICI-Eczematous Dermatitis standard D-irAE, as above previously shown.

Table S18

ICI-ECZEMATOUS DERMATITIS DIAGNOSTIC CRITERIA
DEFINITE **Required:** 1. Classic exam of an eczematous dermatitis **AND** 2. Consistent histology: Spongiosis with or without eosinophils with negative DIF (to rule out urticarial phase BP). **Supportive**: Peripheral eosinophilia, elevated IgE; negative IIF or ELISA for autoimmune bullous disease; background xerosis or excoriations may be present.
PROBABLE: **Required:** 1. Classic exam of an eczematous dermatitis diagnosed by a BCD. **OR** 1. *For non-BCD:* Classic exam of an eczematous dermatitis **AND** 2. Consistent histology: Spongiosis with or without eosinophils. **Supportive**: Peripheral eosinophilia, elevated IgE; negative DIF and IIF or ELISA for autoimmune bullous disease; background xerosis or excoriations may be present.
POSSIBLE: **Required:** 1. Atypical exam with mixed eczematous features diagnosed by a BCD. **OR** 1. Classic exam of an eczematous dermatitis diagnosed by a non-BCD. **Supportive**: Peripheral eosinophilia, elevated IgE; negative DIF and IIF or ELISA for autoimmune bullous disease; background xerosis or excoriations may be present.

Abbreviations: BCD: board-certified dermatologist; BP: bullous pemphigoid; BSA: body surface area; DIF: direct immunofluorescence; IIF: indirect immunofluorescence; IgE: immunoglobulin E; ELISA: enzyme-linked immunoassay

Table S19

ICI-ERUPTIVE ATYPICAL SQUAMOUS PROLIFERATION
Typical Clinical Exam: multiple firm, rapidly growing red crusted papules and plaques, can be intensely pruritic and eroded/ulcerated. Lesions tend to involute spontaneously in contrast to cutaneous SCC, which will continue to grow.

ICI-ERUPTIVE ATYPICAL SQUAMOUS PROLIFERATION WORKUP: Workup of ICI- Eruptive Atypical Squamous Proliferation follows standard D-irAE, as above.

Table S20

ICI- ERUPTIVE ATYPICAL SQUAMOUS PROLIFERATION DIAGNOSTIC CRITERIA For all categories, classic exam is defined as: *Multiple firm, rapidly growing red crusted papules and plaques, can be intensely pruritic and eroded/ulcerated. Lesions tend to involute spontaneously in contrast to cutaneous SCC, which will continue to grow*.
DEFINITE **Required:** 1. Classic exam diagnosed by a BCD. **OR** 1. Classic exam diagnosed by non-BCD **AND** 2. Consistent histology: Invasive proliferation of glassy red keratinocytes with keratin-filled crateriform invagination. Neutrophil microabscesses are common and eosinophils commonly present in surrounding inflammatory infiltrate. Acantholysis is never present. **Supportive:** Rule out presence of lichenoid/LP-like lesions on the rest of the body, including negative nail findings.
PROBABLE **Required:** 1. Classic exam diagnosed by non-BCD. **OR** 1. Consistent histology. **Supportive:** Rule out presence of lichenoid/LP-like lesions on the rest of the body, including negative nail findings.
POSSIBLE **Required:** 1. Consistent histology in the absence of classic exam findings.

Abbreviation: SCC: squamous cell carcinoma; BCD: board-certified dermatologist; LP: lichen planus

Table S21

ICI-EROSIVE MUCOCUTANEOUS DISEASE	
SUBTYPES	**SYMPTOMS**
• Acute onset • Indolent onset	• Usually presents with skin pain that can be preceded by pruritus and more mild symptoms • May be associated with fever and mucosal symptoms/erosions (including oral or genital involvement) • May result in skin detachment
	SUPPORTIVE EXAM FINDINGS
	• ***Acute onset:*** Quick tempo/onset (over maximum 2 weeks without preceding rash) of erosive plaques with positive Nikolsky sign, with or without mucosal symptoms. Early lesions may appear as targetoid patches and plaques without erosions. This may represent an SJS/TEN-like eruption in the appropriate clinical setting. • ***Indolent onset:*** Slower tempo/onset (over 2+ weeks, usually with a preceding benign eruption) of erosive plaques with positive Nikolsky sign, with or without mucosal symptoms.

ICI-EROSIVE MUCOCUTANEOUS WORKUP: Workup of ICI-Erosive Mucocutaneous follows standard D-irAE, as previously shown.

Table S22

ICI-EROSIVE MUCOCUTANEOUS DIAGNOSTIC CRITERIA
DEFINITE **Required:** 1. BCD diagnosed with targetoid lesions or eroded papules and/or plaques, +/- violaceous/dusky appearance. Must include mucosal sites **AND** 2. Histopathology with epidermal necrosis on top of interface and dyskeratotic keratinocytes **AND** 3. Lack of positive testing for immunobullous disease (DIF/IIF/ELISA must be negative) **AND** 4. Lack of diagnosis of a lichenoid eruption or classic lesions of LP on mucosal or cutaneous exam.
PROBABLE **Required:** 1. BCD diagnosed with targetoid lesions or eroded papules and plaques, +/- violaceous/dusky appearance. Must include mucosal sites **AND** 2. Lack of diagnosis of a lichenoid eruption or classic lesions of LP on mucosal or cutaneous exam. **OR** 1. Non-BCD diagnosed with targetoid lesions/eroded papules and plaques, +/- violaceous/dusky appearance. Must include mucosal sites **AND** 2. Histopathology with epidermal necrosis on top of interface and dyskeratotic keratinocytes **AND** 3. Lack of positive testing for immunobullous disease (If DIF/IIF/ELISA must be negative. Not necessary to send) **AND** 4. Lack of diagnosis of a lichenoid eruption or classic lesions of LP on mucosal or cutaneous exam.

POSSIBLE
Required:
1. Non-BCD diagnosed with targetoid lesions/eroded papules and plaques, +/- violaceous/dusky appearance. Must include mucosal sites, without further testing.

Abbreviations: BCD: board-certified dermatologist; DIF: direct immunofluorescence; IIF: indirect immunofluorescence; ELISA: enzyme- linked immunoassay; LP: lichen planus

Table S23

TEST	PRIMARY DATA OR REPORT
Clinical Assessments	Clinical evaluations Emergency department documentation Admission notes Specialty consultation notes Discharge summaries
Lab Testing	All lab reports including assay name and normal range
Imaging	Report
Biopsy Specimens	Report Consider collection of tissue slides Centralized pathology review may be of value

Table S24
Severity criteria, applicable to all dermatologic irAEs.

IRAE SEVERITY GRADE	IRAE SEVERITY GRADE DEFINITION	CTCAE GRADE EQUIVALENT
Death	Death attributable to symptoms	5
Fulminant	Life-threatening symptoms requiring urgent intervention (e.g., ICU/burn level care)	4
Severe	Symptoms interfere with ADLs and/or require treatments that typically involve hospitalization (e.g., IV medications)	3
Moderate	Symptoms interfere with IADLs (but not ADLs) and/or require hospitalization for diagnostic work-up (but not for treatment)	2

Table S25
Examples of each severity grade for D-irAE disease categories.

SEVERITY GRADE	PRURITUS	INFLAMMATORY	BULLOUS/EROSIVE
Death (5)	Not applicable	Death	Death
Fulminant (4)	Not applicable	Erythema covering >90% BSA with associated fluid or electrolyte abnormalities; Inpatient care indicated (ICU care, burn unit may be required)	Blisters covering >30% BSA; associated with fluid or electrolyte abnormalities; Inpatient care indicated (ICU care, burn unit may be required) Target lesions covering >30% BSA; associated with fluid or electrolyte abnormalities; ICU care or burn unit indicated
Severe (3)	Widespread and constant; limiting self- care ADL or sleep	Severe or medically significant but not immediately life-threatening; IV intervention indicated Macules/papules covering >30% BSA with moderate or severe symptoms; limiting self-care ADL Erythema covering >90% BSA with associated symptoms (e.g., pruritus or tenderness); limiting self-care ADL	Blisters covering >30% BSA; limiting self-care ADL Target lesions covering >30% BSA and associated with oral or genital erosions
Moderate (2)	Widespread and intermittent; skin changes from scratching (e.g., edema, papulation, excoriations, lichenification, oozing/crusts); limiting instrumental ADL	Moderate; topical or oral intervention indicated; additional medical intervention over baseline indicated Macules/papules covering 10 - 30% BSA with or without symptoms (e.g., pruritus, burning, tightness); limiting instrumental ADL; rash covering > 30% BSA with or without mild symptoms Erythema covering >90% BSA without associated symptoms; limiting instrumental ADL	Blisters covering 10 - 30% BSA; painful blisters; limiting instrumental ADL Target lesions covering 10 - 30% BSA and associated with skin tenderness
Mild (1)	Mild or localized	Asymptomatic or mild symptoms; additional medical intervention over baseline not indicated Macules/papules covering <10% BSA with or without symptoms (e.g., pruritus, burning, tightness)	Asymptomatic; blisters covering <10% BSA Target lesions covering <10% BSA and not associated with skin tenderness

Abbreviation: BSA: body surface area; ICU: intensive care unit