

A Cross-Sectional Evaluation of Chronic Urticaria Training in Dermatology Residency

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Abstract

Background

Chronic urticaria (CU), including chronic spontaneous urticaria (CSU) and chronic inducible urticaria (CIndU), is associated with impairment in quality of life. Despite established guidelines, variations in clinical practice remain common. This study evaluated U.S. dermatology residents' CU training, guideline awareness, and confidence and knowledge regarding CU diagnosis and management.

Methods

An IRB-exempt, anonymous survey (NCR#246106) was distributed to U.S. dermatology residents through the Derm In-Review listserv. Responses were collected in SurveyMonkey and analyzed using Pearson's chi-square test (statistical significance: $P < 0.05$).

Results

Among 411 respondents (23.5% response rate), most were PGY-4 (50.5%) or PGY-3 (37.8%) residents. Although 74.3% reported receiving sufficient CU education, 50.1% did not follow CU guidelines, and 52.9% and 79.9% were unaware of U.S. or European guidelines, respectively. Most respondents reported being 'confident' (38.8%) or 'somewhat confident' (47.8%) in the diagnostic approach and workup for CU; similar confidence was reported for management. Common CSU workup included complete blood count with differential (73.7%), thyroid-stimulating hormone (50.4%), and C-reactive protein or erythrocyte sedimentation rate (48.3%), with less frequent evaluation for CIndU. More than 75% of residents did not use validated patient-reported outcome measures (PROMs). Second-generation antihistamines were the preferred first-line therapy, and 91.2% reported dose escalation for inadequate response. Second-line treatment selection varied, and more than 75% reported referral to allergy/immunology.

Conclusion

Despite perceived adequate CU training, gaps remain in guideline awareness, use of PROMs, and adherence to evidence-based diagnostic practices. Frequent referral to allergy/immunology may reflect discomfort with management, highlighting opportunities to strengthen CU education during dermatology residency.

Introduction

Chronic urticaria (CU) is a dermatologic disorder characterized by recurrent wheals, angioedema, or both persisting for more than six weeks [11]. When symptoms are elicited by a specific and identifiable trigger, such as temperature, pressure, or light exposure, the condition is classified as chronic inducible urticaria (CIndU), whereas the absence of an identifiable trigger is classified as chronic spontaneous urticaria (CSU) [11]. Although the pathophysiology of CU is not fully understood, current evidence supports a central role for mast cell activation in both CSU and CIndU. Further proposed mechanisms in CSU

include immunoglobulin E (IgE)-mediated autoimmunity, immunoglobulin G (IgG) autoantibodies targeting FcεRI or IgE, and activation of inflammatory pathways that converge on mast cell degranulation and release of histamine, leukotrienes, cytokines, and other inflammatory mediators responsible for wheals, angioedema, and pruritus [1, 2, 4, 6, 7, 10]. Affecting an estimated 1% of the global population, CU is associated with substantial impairment in quality of life (QoL) due to its chronicity, unpredictability, and symptom burden, with patients often experiencing disruption of sleep, daily functioning, work productivity, and psychosocial well-being [7]. Consequently, effective and standardized approaches to diagnosis and management are essential to minimizing disease burden and improving patient outcomes.

Despite the availability of well-established international guidelines for CU management, deviations from guideline-directed care remain common in clinical practice [4, 5]. In a global survey of more than 1,100 physicians across 99 countries, nearly all respondents (96%) reported familiarity with at least one urticaria guideline and stated that they incorporated guidelines into practice; however, 22% acknowledged deviating from guideline recommendations [5]. This discrepancy between guideline awareness and implementation suggests that familiarity alone may not ensure adherence, with many physicians citing reliance on individual clinical experience as a reason for deviation [5]. Residency training represents a critical period during which clinicians establish their foundational approaches to diagnosis and management. Therefore, limited exposure to CU or insufficient reinforcement of evidence-based management principles during residency may contribute to future deviations from recommended practice. To further evaluate the role of residency training in adherence to CU management guidelines, we conducted a survey assessing United States (U.S.) dermatology residents' training, guideline awareness, and clinical confidence and knowledge in diagnosing and managing CU to determine whether deviations from guideline-directed care may originate during training and to help inform future educational interventions within dermatology residency programs.

Materials and Methods

An IRB-exempt, anonymous online survey (NCR#246106) was distributed to dermatology residents in the U.S. on August 5, 2025, via the Derm In-Review listserv, an educational resource and network for U.S. based dermatology residents. Informed consent was obtained prior to survey participation. The 41-question survey consisted of multiple-choice and free-response items assessing resident demographics, awareness of CU guidelines, clinical confidence and knowledge in the diagnosis and management of CU, perceptions regarding the adequacy of residency training in CU education, and potential educational gaps within residency curricula. The first 200 respondents were compensated with a \$20.00 Visa gift card.

Data were collected using SurveyMonkey and reported as a percentage for categorical variables. Statistical significance for categorical variables was assessed by Pearson's chi-square test. Analysis of variance (ANOVA) was used for multiple comparisons. A p-value < 0.05 was considered statistically significant. All analyses were performed using StataC version 16 (StataCorp).

Results

The Derm In-Review listserv includes 1750 U.S. dermatology residents, and a total of 411 respondents completed the survey (23.5% response rate). The majority of respondents were upper-level residents, postgraduate year (PGY)-3s (37.8%) and PGY-4s (50.5%), and most practiced in an academic or university setting (83.2%). Detailed demographics and program characteristics are depicted in **Table 1**.

Education and Clinical Experience

When asked about prior education on CU diagnosis and management, a majority of respondents (80.1%) reported receiving education on CU, 18.2% reported non-specific or minimal education on CU, and 1.7% reported no education on CU. Around 75% of residents felt that there were sufficient educational opportunities to learn about CU in their residency program. Among those who received CU education or training during residency, most experiences came from didactics (83.3%), clinical experience (76.7%), individual reading/research (47.7%), or conferences (44.4%). Education in CU inevitably increased as resident PGY increased ($p<0.001$).

When assessing prior clinical experience with CU, most respondents (86.8%) reported they have diagnosed and/or managed CU during their clinical training. The average reported number of new CU patients per month were one to two patients (61.1%), followed by zero (17.2%) or three to five (16.9%). The average number of follow-up CU patients were one to two patients (60.6%), three to five (20.2%), or zero (13.9%). At the time of clinical presentation, approximately 43.8% of CU patients had moderate to severe disease, defined by persistent hives that are generally manageable with over the counter (OTC) antihistamines but may interfere with daily activities, 27.5% had mild to moderate, and 13.9% had mild, defined by occasional hives, manageable with OTC antihistamines.

Most respondents felt 'confident' (38.8%) or 'somewhat confident' (47.8%) in their knowledge of and approach to the diagnostic workup for CU, with confidence increasing with advancing PGY education ($p<0.001$). Confidence in the management of CU was similar with 46.9% reporting feeling 'confident' and 36.7% reporting feeling 'somewhat confident'. Similarly, confidence in the management of CU increased with advancing dermatology PGY education ($p<0.001$).

Screening and Diagnostic Workup

Around 58.9% of dermatology residents reported screening for comorbidities of CU. For CSU, the most commonly screened comorbidities included autoimmune thyroid disease (77.8%), asthma (48.7%), systemic lupus erythematosus (47.4%), food allergies (44.8%), allergic rhinitis (42.2%), CIndU (38.3%), hepatitis C (29.6%), hepatitis B (29.1%), and malignancy (28.3%). Comorbidity screening for CIndU was less common, with autoimmune thyroid disease (57.2%), asthma (40.8%), allergic rhinitis (35.3%), and food allergies (32.3%) as the leading screened comorbidities.

Diagnostic workup for CSU patients consisted primarily of complete blood count (CBC) with differential (73.7%), thyroid-stimulating hormone (TSH) (50.4%), C-reactive protein (CRP) or erythrocyte

sedimentation rate (ESR) (48.3%), and antinuclear antibody levels (ANA) (41.8%). Diagnostic workup for CIndU was similar with leading tests including CBC with differential (52.4%), CRP/ESR (36.0%), and TSH (32.4%). Nearly 30% of respondents reported performing no diagnostic work-up for CIndU, compared with 14.5% for CSU. There was no significant difference between practice setting and comorbidity screening or diagnostic workup. Detailed CSU and CIndU diagnostic workup depicted in **Figure 1**.

Additionally, most respondents reported they did not use any validated patient-reported outcome measures (PROMs) for CSU (78.3%) or CIndU (80.4%). The most commonly utilized validated PROM was the Urticaria Activity Score over 7 days (UAS7), reported by 11.1% of respondents for CSU and 10.3% for CIndU. Interestingly, PGY-2 residents and those practicing in community hospital settings were more likely to utilize PROMs than PGY-3 and PGY-4 residents and those in academic or military settings ($p<0.001$).

Treatment

When asked about first-line medication prescribed for CU, a majority of respondents reported second generation antihistamines for CSU (83.2%) and CIndU (79.4%), followed by first generation antihistamines (CSU: 9.6%, CIndU: 11%), and topical corticosteroids (CSU: 1.9%, CIndU: 2.4%). The most commonly prescribed antihistamines regardless of disease severity included cetirizine (59.5%) and fexofenadine (22%). PGY-3 and PGY-4 residents were significantly more likely to select second generation antihistamines as first line treatment compared to PGY-2 residents ($p<0.001$). Residents most commonly prescribed initial antihistamine treatment at four times the labeled dose (44.1%), followed by two times the labeled dose (37.4%), and at the labeled dose (12.6%). PGY-3 and PGY-4 residents were significantly more likely to initiate antihistamine dosing at two or four times the labeled dose, while PGY-2 residents most commonly prescribed labeled dosing as initial therapy ($p<0.001$).

Among CU patients unresponsive to the initial antihistamine dose, 50.4% of respondents reported they would switch to a different antihistamine. If patients were unresponsive to initial antihistamine dosing, over 90% of respondents would up-titrate antihistamine dosing, most commonly at four times (85.0%) or two times (10.9%) the labeled dose. This titration was commonly completed over three to four weeks (41.4%) or one to two weeks (37.5%).

While most respondents agreed on antihistamines as first-line treatment, second-line treatment recommendations varied. The most commonly prescribed second-line therapies for CSU were omalizumab (31.42%), dupilumab (23.8%), leukotriene antagonists (13.4%), topical corticosteroids (7.9%), and systemic corticosteroids (7.7%). Similar trends were observed for CIndU, with omalizumab (31.7%), dupilumab (21.1%), and leukotriene antagonists (12.5%) representing the three most commonly prescribed second-line therapies. Additionally, 83.5% of respondents reported continuing patients on antihistamines regardless of initiating additional medications.

Patterns of systemic corticosteroid use also varied among respondents, with 44.9% reporting they do not prescribe systemic steroids for CU patients, 44.6% prescribing during flares only, 6.6% during both

flares and routine management, 2.5% during routine management only, and 1.4% for other reasons. PGY-2 residents were significantly more likely to prescribe topical or systemic corticosteroids for second-line CU management compared to PGY-3 and PGY-4 residents ($p<0.001$).

Guideline Awareness and Multidisciplinary Collaboration

When asked about awareness of guidelines for the diagnosis and management of CU, 52.9% of respondents denied awareness of any U.S. guidelines and 79.9% denied awareness of any European guidelines. Furthermore, around 50.1% of respondents denied following any CU guidelines. Familiarity with CU guidelines increased with advancing dermatology PGY education, though results were not statistically significant. Additionally, over 75% of respondents report collaboration with allergy and/or immunology for CU patients. When asked to explain their reasoning for this choice, the most common reasons included allergy/immunology's experience with omalizumab prescribing and administration, evaluation of underlying allergic triggers, and patch or allergy testing.

Discussion

This study evaluated U.S. dermatology residents' education, guideline awareness, confidence, and clinical approaches to the diagnosis and management of CU. Although most respondents reported receiving education on CU during residency and felt that their program provided sufficient educational opportunities, variability remained in diagnostic evaluation, familiarity with established guidelines, and therapeutic decision making.

The 2026 International Urticaria Guidelines, provides updated evidence- and consensus-based recommendations for the diagnosis and management of urticaria across diverse healthcare settings [11]. These new international guidelines are an update of the the European Academy of Allergy and Clinical Immunology (EAACI)/ Global Allergy and Asthma Excellence Network (GA²LEN)/European Guidelines on Diagnosis and Treatment in Dermatology (EuroGuiDerm)/ Asia Pacific Association of Allergy, Asthma and Clinical Immunology (APAAACI) guidelines on urticaria published in 2022 [12]. According to these guidelines, evaluation of patients with CU begins with a comprehensive history and physical examination, exclude alternative diagnoses, and identify potential triggers, medication exposure, lifestyle factors, and comorbidities that may influence disease course or management [11]. CU warrants a focused but limited routine diagnostic workup, with additional investigations only when clinically indicated [11]. Recommended baseline studies include a CBC with differential and inflammatory markers, such as CRP and/or ESR, while additional investigation including total IgE, anti-thyroid peroxidase (TPO) antibodies, total immunoglobulin A (IgA), basophil and eosinophil counts, and provocation testing in patients with suspected CIndU, are guided by clinical suspicion [6, 12]. In addition to diagnostic evaluation, current guidelines emphasize the routine assessment of disease activity, disease control, and QoL using validated PROMs, including the UAS7, Angioedema Activity Score (AAS), Chronic Urticaria Quality of Life Questionnaire (CU-Q2oL), Angioedema Quality of Life Questionnaire (AE-

QoL), and the Urticaria Control Test (UCT) [12]. These instruments provide standardized measures that guide therapeutic decision-making and assess treatment response [12].

Management of CU is aimed at achieving complete symptom control while minimizing treatment-related adverse effects and preserving QOL [12]. Current international guidelines advocate for a stepwise treatment algorithm centered on suppression of mast cell activation and blockade of inflammatory mediators [12]. First-line therapy consists of daily second-generation H1-antihistamines, with dose escalation up to fourfold in patients with inadequate response [12]. For patients who remain symptomatic despite high-dose antihistamines, add-on therapy with omalizumab, an anti-IgE monoclonal antibody, is recommended [12]. Recent advances in the understanding of CSU immunopathogenesis have led to the development of targeted biologic and small molecule therapies into updated treatment guidelines [11]. In April 2025, the interleukin (IL)-4/IL-13 inhibitor dupilumab was approved by the U.S. Food and Drug Administration (FDA) as an add-on therapy for adults and adolescents with CSU inadequately controlled with high dose second generation H1-antihistamines, particularly in patients with comorbid asthma, chronic rhinosinusitis with nasal polyps, or atopic dermatitis (AD) [8, 11]. Additionally, the oral Bruton tyrosine kinase (BTK) inhibitor remibrutinib received FDA approval in September 2025 for adults with CSU who remain symptomatic despite H1-antihistamines [3]. Both dupilumab and remibrutinib were subsequently incorporated into the updated 2026 international treatment guidelines [11]. For patients with CU refractory to H1-antihistamines and omalizumab, off-label cyclosporine (3.5-5 mg/kg/day) may be considered, although its immunosuppressive effects and long-term lab monitoring warrant caution [9, 11]. Current guidelines recommend against long-term systemic glucocorticoids and advise limiting oral corticosteroids to short (≤ 10 -day) courses for acute flares [11]. Evidence supporting topical corticosteroids in CU is lacking [11]. Leukotriene receptor antagonists, particularly montelukast, may benefit select patients, though supporting evidence is limited [12]. Other therapies, including sulfasalazine, methotrexate, dapsone, phototherapy, intravenous immunoglobulin, and TNF- α inhibitors, are supported only by low-quality evidence and are generally reserved for highly specialized care [12].

In contrast to current guideline recommendations, many residents reported routinely ordering broader laboratory workups, including TSH, ANA, IgE, complement studies, anti-TPO antibodies, and patch or allergy testing. While some of these investigations may be appropriate in select clinical scenarios, the frequency with which they were reported suggests potential overutilization beyond guideline-directed recommendations. The frequent use of extensive laboratory testing may reflect diagnostic uncertainty, concerns for underlying systemic disease, and variability in clinical training, highlighting an opportunity for targeted resident education on evidence-based diagnostic evaluation.

Another notable finding was the limited use of validated PROMs, despite guideline recommendations emphasizing their importance in assessing disease activity, disease control, and QoL. The low utilization of PROMs suggests that structured longitudinal monitoring may not yet be routinely integrated into dermatology residency education or clinical practice. Additionally, PROMs are often used to support prior authorization requests, as objective clinical findings alone may not fully capture the burden of skin disease. Documentation of validated PROMs may also be required to justify the initiation or continuation

of advanced therapies by payers, further highlighting their clinical and practical importance. Increased incorporation of these tools into resident training may improve objective assessment of treatment response and facilitate more standardized management approaches.

In regard to treatment practices, residents largely demonstrated adherence to the recommended first-line management strategies. Most respondents appropriately identified second-generation antihistamines as first-line therapy for both CSU and CIndU and reported dose escalation up to fourfold for patients with inadequate response, consistent with current recommendations. Additionally, most residents reported continuing antihistamines even after initiating additional therapies, which similarly aligns with guideline-directed care. Second-line treatment selection demonstrated greater variability. Omalizumab and dupilumab were among the most commonly selected therapies for refractory disease, reflecting increasing awareness of targeted biologic therapies in CU management. Importantly, the survey was conducted prior to the FDA approval and incorporation of remibrutinib into the updated 2026 international guidelines and therefore was not included in the survey. Although some respondents reported use of systemic corticosteroids and topical corticosteroids, corticosteroid use largely varied, with many residents appropriately limiting systemic corticosteroids to acute flares or avoiding them entirely in accordance with current recommendations discouraging long-term steroid use in CU.

While residents reported sufficient clinical exposure to CU, most reported managing one to two new and one to two follow-up CU patients per month. This comparatively low patient volume may contribute to reduced confidence in management and limited familiarity with guideline-based care. Furthermore, variability in management beyond antihistamines may therefore be influenced more heavily by local practice patterns, attending preferences, or multidisciplinary referral structures rather than standardized evidence-based algorithms.

Overall, most residents demonstrated moderate confidence in both the diagnosis and management of CU, demonstrated by 'confident' or 'somewhat confident' range, with confidence increasing among more senior trainees. This trend likely reflects increasing clinical exposure throughout residency training. However, despite perceived adequacy of training, many respondents reported limited familiarity with established U.S. and/or European CU guidelines, and approximately half denied routinely following any formal guideline recommendations. These findings suggest that exposure to CU during residency may not consistently translate into structured, evidence-based management practices.

The high rate of referral to allergy and/or immunology further highlights potential uncertainty surrounding CU management within dermatology training. Many respondents cited allergy/immunology expertise in omalizumab administration, allergy testing, and evaluation of allergic triggers as reasons for referral. However, most cases of CU can be effectively diagnosed and managed within dermatology, particularly under modern treatment paradigms emphasizing antihistamines and targeted biologic therapies. Frequent referral for omalizumab administration may also limit residents' exposure prescribing and managing omalizumab, despite its established role in CU treatment and the expanding use of biologics within dermatology. While multidisciplinary collaboration remains important in select

cases, the frequency of referrals observed in this study may reflect gaps in resident confidence and guideline familiarity rather than clinical necessity alone.

This study is limited by its survey-based design, which may introduce response and recall bias. Additionally, participants were recruited through the Derm In-Review listserv, which may not capture all U.S. based dermatology residents, although it is a widely utilized educational platform that includes a large proportion of dermatology trainees nationwide.

Conclusion

Taken together, these findings suggest that while dermatology residents are generally exposed to CU during training, there remain opportunities to strengthen guideline-focused education, improve familiarity with validated assessment tools, reinforce evidence-based diagnostic evaluation, and increase resident comfort with advanced therapeutic management.

Declarations

Ethics Statement

This study was reviewed and deemed exempt by the George Washington University Institutional Review Board (IRB) (NCR#246106)

Competing Interests:

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Author Contribution

NZ: manuscript composition
MF: manuscript composition
SV: Study design, figure prep
NM: Study design, figure prep
AS: Data analysis
PP: Statistical analysis
NH: Statistical analysis
AF: Study design, manuscript composition
All authors reviewed the manuscript

Data availability:

The datasets generated and/or analyzed during the current study are available from the authors upon reasonable request.

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table

Table 1 Background characteristics of dermatology residents, including level of training, practice setting, and program size (N=411)

Characteristics	Percentage (N=411)
Level of Training	
PGY-2	5.1%
PGY-3	37.8%
PGY-4	50.5%
Other	6.6%
Practice Setting	
Academic/University	83.2%
Community Hospital	13.9%
Military	1.5%
Other	1.4%
Number of Residents in Program	
2-6	14.6%
7-12	39.4%
13+	45.0%
Other	1.0%

Figures

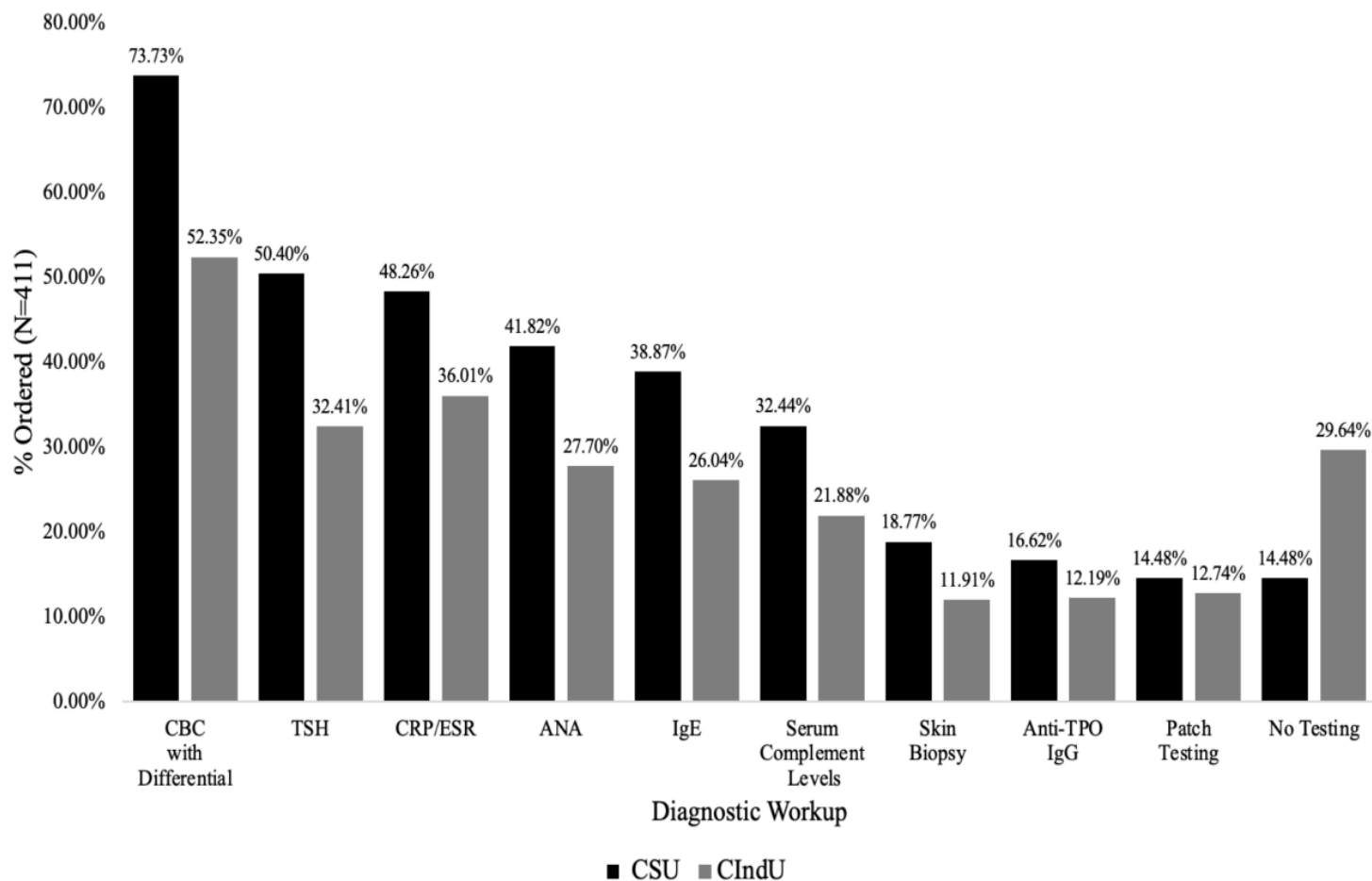


Figure 1

Diagnostic workup of CSU and CIndU patients