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OPTIMIZATION AND SIMPLIFICATION OF THE ALLERGIC AND HYPERSENSITIVITY
CONDITIONS CLASSIFICATION
FOR THE ICD-11

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ABSTRACT

Background: Since 2013, an international collaboration of Allergy Academies, including first the World Allergy Organization (WAO), the American Academy of Allergy Asthma and Immunology (AAAAI) and the European Academy of Allergy and Clinical Immunology (EAACI), and then, the American College of Allergy, Asthma and Immunology (ACAAI), the Latin American Society of Allergy, Asthma and Immunology (SLAAI) and the Asia Pacific Association of Allergy, Asthma and Clinical Immunology (APAAACI), has spent tremendous efforts to have a better and updated classification of allergic and hypersensitivity conditions in the forthcoming International Classification of Diseases (ICD)-11 version by providing evidences and promoting actions for the need for changes. The latest action was the implementation of a classification proposal of hypersensitivity/allergic diseases built by crowdsourcing the Allergy Academy leaderships.

Methods: Following bilateral discussions with the representatives of the ICD-11 revision, a face-to-face meeting was held at the United Nations Office in Geneva and a simplification process of the hypersensitivity/allergic disorders classification was carried out to better fit the ICD structure.

Results: We are here presenting the end result of what we consider to be a model of good collaboration between the World Health Organization and a specialty.

Conclusion: We strongly believe that the outcomes of all past and future actions will impact positively the recognition of the allergy specialty as well as the quality-improvement of health care system for allergic and hypersensitivity conditions worldwide.

Keywords: allergic disorders, hypersensitivity, classification, International Classification of Diseases (ICD), World Health Organization (WHO)

The need to update the hypersensitivity/allergic disorders classification

In 2012, we confirmed the under reporting of anaphylaxis deaths due to difficult coding under the International Classification of Diseases (ICD)-10 (1). Believing that the coding definitions should be standardized not just for anaphylaxis but for all hypersensitivity/allergic disorders, we have built up an international collaboration of Allergy Academies, initially including the World Allergy Organization (WAO), the American Academy of Allergy Asthma and Immunology (AAAAI) and the European Academy of Allergy and Clinical Immunology (EAACI) to coordinate efforts to provide a better classification of these disorders in the new ICD-11. We first conducted an international survey and demonstrated that the ICD is the most frequently used classification system by the allergy community worldwide; however, it was not considered appropriate in clinical practice (2).

Early bilateral discussions with the representatives of the ICD-11 revision group have been put in place. After a careful comparison between ICD-10 and ICD-11 beta phase codes we identified gaps and trade-offs (3) allowing us to construct a classification proposal that followed the recommended ICD/WHO rules in particular with the aim to be used by allergists, non-allergists and non-physicians. Thereafter, this proposal was validated by crowdsourcing allergist leaderships' community (4). The high level complex structure underwent a cross-linking terms process to contribute to aligning the hypersensitivity/allergic disorders classification to the ICD-11 beta draft facilitating the classification proposal acceptance (5).

The proposed model has been presented to the World Health Organization (WHO) groups in charge of the ICD revision and, advised by these groups, we performed a technical process of simplification in the attempt to better fit it to the ICD-11 framework.

The need of optimization and simplification of the proposed hypersensitivity/allergic disorders classification

The WHO meeting took place in Geneva, December 7th to 9th 2014. During 2 days, we met representatives from the Classifications, Terminologies and Standards (CTS) department of WHO responsible for the revision of the ICD, named Revising Steering Group (RSG), and the Pediatric Topic Advisory Group (TAG). In this meeting it was possible to expose details of the actions of the Allergy

Academies task forces and the constructed classification proposal (4). The strategies used and the collaboration from Academies were acknowledged and the classification proposal has been well accepted.

WHO asked to simplify the document as much as possible for the following reasons: (I) prevalence of disorders, (II) possibility of post-coordination, (III) need of simplification for non-allergists, (IV) number of the terms needed to fit the ICD-11 framework (letters and numbers) and (V) alignment of overlapping conditions through agreement with related TAGs. WHO also asked for a list of missing terms to be included into the ICD-11 structure. The main outcome of the meeting was the offer to include a section of “allergic and hypersensitivity conditions” under the “Disorders of the immune system” chapter, highlighting the recognition of our specialty.

In this manuscript, we present the process of simplification to better fit the current ICD-11 beta draft structure (December 2014 version) and the outcomes of this process (6). We also built a list of missing terms/conditions able to be implemented into the ICD framework.

METHOD OF OPTIMIZATION AND SIMPLIFICATION PROCESS FOR THE ICD-11

Based on the need of simplification and optimization of the classification of hypersensitivity/allergic disorders, we lay hold a strategy (Figure 1) according to the criteria suggested by the RSG. The published hypersensitivity/allergic disorders classification validated by crowdsourcing the Allergy Academy leaderships (4) was the basis of the proposed simplification process and all the process was validated by a core group (LKT, PD) and cross-checked to avoid overlapping terms and words able to provide dubious interpretation of data.

In order to reduce the number of terms listed in the published hypersensitivity/allergic disorders classification (4), we first identified the terms able to undergo the post-coordination process. From the ICD-11 perspective, “post-coordination” is the adding to an existing entity (known as a stem code) additional details to provide greater specificity to the entity. These additional details are known as ‘extension codes’ and provide information on severity, causality, and anatomy. The primary benefit of post-coordination is to reduce the users’ effort (no need to know the rules governing citation order) and potentially to provoke queries (any document can be retrieved if any of its uncoordinated subject terms matches any term in the uncoordinated list of query terms).

In the second step of the process, the terms already listed in other ICD-11 chapters (December 2014 version) have been identified to enable them to be multiply parented to the section “Allergic and hypersensitivity conditions”. This process had an on line basis and intend to facilitate the searching codes/terms by the end-users and avoid duplications and ambiguities across the ICD structure. The conditions with low frequency have been withdrawn or inserted as inclusions of main heading terms.

Following the above method, we were able to prepare a list of missing terms by comparing the published cross-linking terms data (5) and the current simplification process. Codes were then shared with related TAGs and working groups (WG) (Pediatric, Dermatology and Ophthalmology, Internal Medicine, Rare Diseases TAGs and Respiratory and Gastroenterology WGs), via emails and/or posts in the ICD-11 platform.

RESULTS OF THE OPTIMIZATION AND SIMPLIFICATION PROCESS

The published Hypersensitivity/allergic disorders classification counts with a total of 652 terms distributed in 5 main groups (4). Table 1 provides the number of terms of each domain able to be post-coordinated, listed in other ICD-11 chapters and the number of terms per domain in the simplified version of the hypersensitivity/allergic disorders classification, renamed “allergic and hypersensitivity conditions” classification. No condition with low frequency has been withdrawn or inserted as inclusions of main heading terms. The final simplified version counts with 215 terms, but kept the same original structure and the philosophy used for its construction (Annex 1). The list of missing terms, including conditions, causes and allergens, is shown in Table 2. Agreement with related TAGs was obtained.

DISCUSSION

The new “Allergic and hypersensitivity conditions” chapter

Although the proposed classification has been validated by the Allergy Academy leaderships and acknowledged by the WHO ICD experts, the simplification and optimization process became a mandatory step for the better representativity into the ICD-11 structure by the possibility of the construction of a parented “Allergic and hypersensitivity conditions” chapter. This procedure allowed us to have a critical coder view from the published hypersensitivity/allergic disorders

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classification (4) and tune it to better fit the ICD-11 framework, besides identify the residual missing terms.

About one third of the previous classification was able to be post-coordinated, particularly for “anaphylaxis”, food-related hypersensitivity/allergic disorders involving the gastrointestinal tract” and for “drug hypersensitivity” domains. It means that many headings can be combined with individual elements that represent clinical presentation, cause, site or underlining mechanism (*e.g.*, “drug induced-anaphylaxis” as the condition + “Penicillin” as the cause). In practice, it can be used for complex and multi-element conditions to achieve coverage, in particular after the established diagnosis.

We could observe that although the hypersensitivity/allergic diseases were distributed across the ICD-11 structure in many different chapters, covered by specialties with whom we have overlapping entities, the current ICD framework was able to capture just 18% of the previous published hypersensitivity/allergic disorders classification, even considering the post-coordination.

The list of the missing ICD terms was mainly related to etiological factors/agents. If implemented as extension codes, all the terms will be able to be post-coordinated. Although the current guidelines and position papers classifying the severity and the chronology of our hypersensitivity/allergic diseases, we prioritized the conditions’ underlining mechanism in the ICD identification terms for two main reasons: (i) the mechanism does not change (*e.g.*, “allergic rhinitis”), while the severity and chronology can change in the natural history of the diseases or due to management interventions (*e.g.*, the patient can present an severe persistent rhinitis at the first evaluation and be reclassified as mild intermittent rhinitis after treatment); (ii) since the hypersensitivity and allergic conditions have been misclassified in the ICD so far and we intend to strengthen the allergy specialty in this international classification system, we believe that by using the terms and concepts currently accepted by the allergy community, we will be able to increase the visibility of the our conditions of interest by giving it an unit/chapter.

Critical view of the optimization and simplification process

Since the online ICD-11 beta draft platform is not final and is updated regularly, the current results may not be reproduced if taken in a different time of analysis with the same methodology. This is especially true since our research is immediately posted to the ICD-11 platform, leading to updates once accepted by all stakeholders. Although this work presents technical aspects of

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classification and coding, by publishing it we intend to introduce and simplify the complex concepts with the aim of becoming more familiar to the allergy community ICD end-users.

The present results are crucial for the possibility to construct the new chapter addressing the conditions of our specialty. Although we are aware that more changes may occur during the forthcoming final steps of ICD-11 construction and validation our efforts to have allergic and hypersensitivity conditions updated and well classified in the ICD-11 will have important impact for the visibility and identity of our specialty.

Forthcoming steps for classification of hypersensitivity/allergic disorders

The tuned version of the hypersensitivity/allergic disorders classification as well as the list of missing terms endorsed by WHO and related TAGs and WGs (Pediatric, Dermatology, Rare Diseases, Ophthalmology, Internal Medicine, Respiratory and Gastroenterology) was the basis of the construction of the new “Allergic and hypersensitivity conditions” section parented under the “Disorders of the Immune System” chapter (Annex 1). Upon WHO guidance, all the proposals have been submitted into the ICD-11 beta draft platform. The building process was a detailed technical/scientific labor-intensive construction in which to reach a harmonized view regarding overlapping conditions, in agreement with relevant TAGs and WGs. The list of missing terms will be added as extension codes to allow post-coordination. Once the classification is included into the ICD-11 framework, our aim is to carry on working in collaboration with WHO to validate/disseminate the classification by field trial. For it, we count on the support of all major Allergy Academies, the World Allergy Organization, American Academy of Allergy Asthma and Immunology and European Academy of Allergy and Clinical Immunology, the American College of Allergy, Asthma and Immunology, the Latin American Society of Allergy, Asthma and Immunology and the Asia Pacific Association of Allergy, Asthma and Clinical Immunology.

Currently, we are unable to objectively measure the consequences of these changes into the ICD framework, but we strongly believe that the outcomes of all past and future actions will impact positively the recognition of the allergy specialty as well as the quality-improvement of health care system for allergic and hypersensitivity conditions worldwide.

LIST OF TABLES

Table 1: Simplification process: number of terms per domain, identified to be post-coordinated, listed in other ICD-11 chapters and the results of the process.

Table 2: List of terms missing in the ICD-11 Foundation (December 2014 version) and proposed to be added as extension codes in the ICD-11 beta draft platform.

LIST OF FIGURES

Figure 1: Process for a simplified version of the Hypersensitivity/Allergic disorders classification to the ICD-11 framework.

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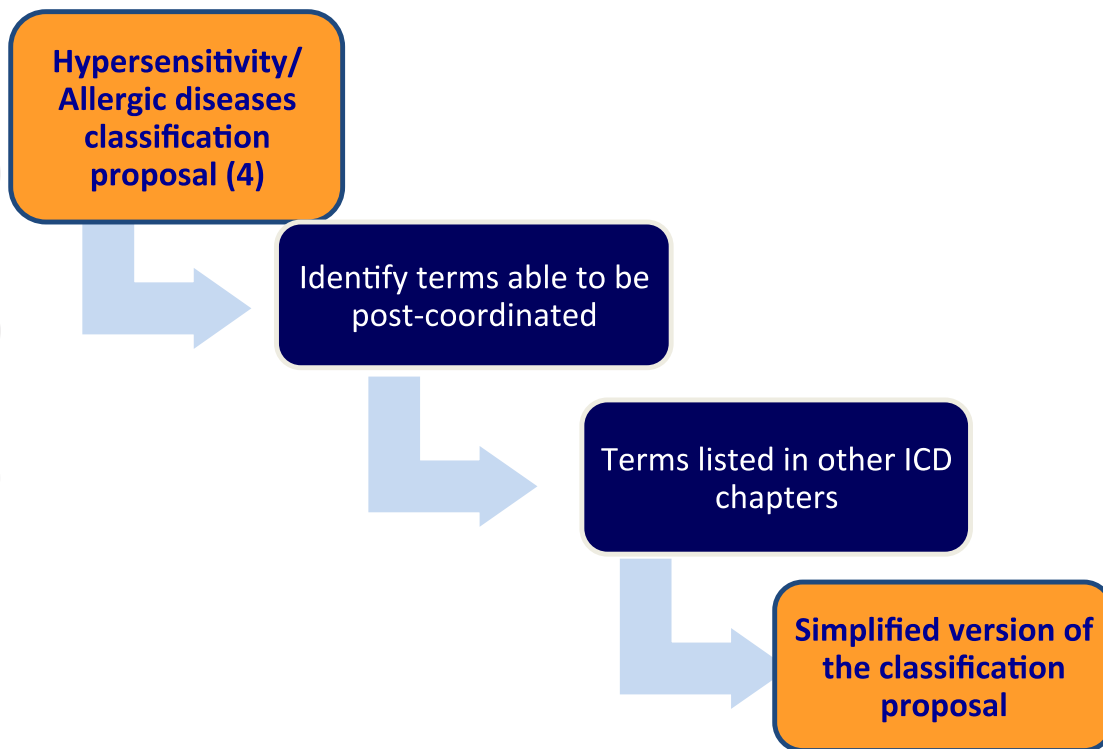


Figure 2: Process for a simplified version of the Hypersensitivity/Allergic disorders classification to the ICD-11 framework

Table 1: Simplification process: number of terms per domain, identified to be post-coordinated, listed in other ICD-11 chapters and the results of the process

Domains of Hypersensitivity/Allergic Diseases Classification (4) (number of terms listed in 652)		Simplification Process		Results of the simplification process – Number of terms for the allergic and hypersensitivity conditions domains N (%)
		Post-coordination N (%)	Terms listed in other ICD-11 chapters (Linearization December 2014 version) N (%)	
Hypersensitivity/Allergic disorders involving the eye and the respiratory tract (179 terms)		56 (31)	23 (13)	56 (31)
Hypersensitivity/Allergic disorders involving the skin and mucous membranes (149 terms)		40 (27)	35 (23)	80 (54)
Hypersensitivity/Allergic disorders involving the digestive tract (28 terms)		15 (53)	6 (21)	8 (29)
Anaphylaxis (85 terms)		48 (56)	10 (12)	17 (20)
Complex hypersensitivity/ allergic diseases	Drug hypersensitivity (119 terms)	59 (50)	20 (17)	36 (30)
	Hymenoptera hypersensitivity (18 terms)	4 (22)	8 (44)	14 (78)
	Food hypersensitivity (74 terms)	16 (22)	16 (21)	4 (5)

Table 2: List of terms missing in the ICD-11 Foundation (December 2014 version) and proposed to be added as extension codes in the ICD-11 beta draft platform

MISSING ALLERGENS AND CAUSES	
Inhaled allergen	
Dust mites	Fungus
<i>Blomia tropicalis</i>	<i>Alternaria alternata</i>
<i>Dermatophagoides pteronyssinus</i>	<i>Aspergillus fumigatus</i>
<i>Dermatophagoides farinae</i>	<i>Aspergillus sp</i>
<i>Dermatophagoides sp</i>	<i>Candida albicans</i>
<i>Euroglyphus maynei</i>	<i>Cladosporum sp.</i>
<i>Lepidoglyphus destructor</i>	Mold
<i>Tyrophagus putrescentiae</i>	<i>Penicillium sp.</i>
Pollens	<i>Saccharomyces cerevisiae</i>
<i>Ambrosia artemisiifolia</i> (Ragweed)	Cockroach
<i>Ambrosia elatior</i> (Ragweed)	<i>Blatela germanica</i>
<i>Ambrosia sp.</i>	<i>Periplaneta Americana</i>
<i>Ambrosia trifida</i> (Ragweed)	<i>Blatta orientalis</i>
<i>Anthoxanthum odoratum</i> (Sweet vernal)	Animal allergen/ Animal dander: Cat dander
<i>Artemisia vulgaris</i> (Mugwort)	Cow dander
<i>Betula verrucosa</i> (Birch)	Dog dander
<i>Cryptomeria japonica</i>	Goat epithelium
<i>Cupressus arizonica</i>	Guinea pig epithelium
<i>Cupressus sempervirens</i>	Hamster epithelium
<i>Cynodon dactylon</i> (Bermuda grass)	Mouse epithelium
<i>Dactylis glomerata</i> (Orchard)	Mouse serum proteins Mouse urine proteins
<i>Juniperus ashei</i> (Mountain cedar)	Rabbit epithelium
<i>Lolium perenne</i> (Perennial rye)	Rat epithelium
<i>Parietaria judaica</i>	Rat serum proteins
<i>Parietaria officinalis</i>	Rat urine proteins

<i>Paspalum notatum (Bahia grass)</i> <i>Phleum pretense (Timothy grass)</i> <i>Plantago lanceolata (Plantain)</i> <i>Poa pratensis (Kentucky blue grass)</i> <i>Salsola kali (Russian thistle)</i> <i>Salsola pestifer</i> <i>Salsola sp</i> <i>Sorghum halepense (Johnson grass)</i> Latex	Sheep epithelium Horse epithelium Bird feather Canary feather Chicken feather Duck feather Goose feather Parakeet feather Parrot feather
Hymenoptera and other insects hypersensitivity/allergy	Work related asthma
Hymenoptera Ant sting <i>Argas reflexus</i> Arthropod allergy Bee sting (just in Foundation) Bee venom Bumblebee Fire ant Hornets Hornets venom <i>Siphonaptera</i> Venom allergy Wasp venom	Spray painting, French polishing Baking, milling, pastry Electronic soldering Heath-care workers Plastic and foam manufacturing Woodworking and forestry work Farmers Textile work Hairdressing Latex

Drugs and pharmacological formulations	
Radio-contrast media	Glucocorticoids
Detergent enzymes	Oral hypoglycemic [antidiabetic] drugs
Glycopeptide antibiotics	Thyroid hormones and substitutes
Topical vasoconstrictors	Antithyroid drugs
Eye drop components	Oral contraceptives
Drug preservatives	Antigonadotrophins, antiestrogens, antiandrogens
Angiotensin converting enzyme (ACE) inhibitor	Serum and blood products
Non-steroidal anti-inflammatory drugs	Biological agents
Synthetic hormones (contraceptives)	Vaccines
Systemic antibiotics	Gelatin
Topical antibiotics	Antineoplastic agent
Beta lactam antibiotics	Antineoplastic antimetabolites
Cephalosporin	Antineoplastic natural products
Non-beta lactam antibiotics	Specific allergen immunotherapy
Chloramphenicol group	Local anesthetic agents
Macrolides	General anesthetic agents
Tetracycline	Barbiturates
Aminoglycosides	Benzodiazepines
Rifampicin	Curare
Antifungal antibiotics	Opioid
Sulfonamides	Immunosuppressive agents
Antiviral drugs	Anticoagulants
Antimalarial	Vitamin
Antihelmintcs	Anticonvulsants
Insulin	

Food allergens				Plant allergen
Almond	Egg	Mango	Peas	Contact allergens
Apple	Egg white	Meat	Pineapple	
Banana	Fish	Milk	Pork	
Beans	Flour	Mollusks	Sesame	
Beef	Food additives	Mushroom	Shellfish	Topical irritants
Brazilian nut	Grape	Mustard	Shrimp	
Cacao	Hazel nut	Nut	Soy	
Celery	Kiwi	Oat	Spices	
Chicken	Lupin	Peach	Sulphur dioxide/sulphites	
Coconut	Maize	Peanut	Tree nuts	
Crab	Malt	Pear	Wheat	

EXTENSION CODES CONDITIONS			
RHINITIS		ALLERGIC CONJUNCTIVITIS	ASTHMA
Severity:	Duration:	Seasonality:	Severity:
- Mild	- Intermittent	- Seasonal	- Mild
- Moderate/severe	- Persistent	- Perennial	- Moderate
			- Severe
ANAPHYLAXIS			
Anaphylaxis classified by clinical severity			
Anaphylaxis grade 1 [single system]			
Anaphylaxis grade 2 [more than one system; not life-threatening]			
Anaphylaxis grade 3 [more than one system; life-threatening]			
Anaphylaxis grade 4 [life-threatening with cardiac arrest]			

Annex 1: From the Hypersensitivity/Allergic disorders classification proposal to the new “Allergic and hypersensitivity conditions” ICD-11 section

SIMPLIFICATION OF THE CLASSIFICATION OF ALLERGIC/HYPERSENSITIVITY DISORDERS	THE “ALLERGIC AND HYPERSENSITIVITY CONDITIONS” ICD-11 SECTION (Foundation March 2015 version)
Hypersensitivity/Allergic disorders involving the respiratory tract	Allergic or hypersensitivity disorders involving the respiratory tract
Hypersensitivity/Allergic disorders involving the upper respiratory tract	
Rhinitis	Allergic and non-allergic rhinitis
Allergic rhinitis	Allergic rhinitis
<i>Incl.: Allergen-induced Rhinitis</i>	- Allergic rhinitis due to allergens - Allergic rhinitis due to pollen - Allergic rhinitis due to house dust mite - Other allergic rhinitis due to allergens - Other allergic rhinitis
Occupational Rhinitis	
- Rhinitis caused by work - Rhinitis exacerbated by work	
Non-allergic non-infectious Rhinitis	Non-allergic rhinitis
<i>Incl.: Non-allergen induced Rhinitis</i>	Gustatory rhinitis
Rhinitis of the elderly	Hormonal-induced rhinitis
Gustatory rhinitis	- Rhinitis related to pregnancy - Rhinitis related to hypothyroidism
Hormonal-induced rhinitis	Drug-induced Rhinitis
- Rhinitis related to pregnancy - Rhinitis related to hypothyroidism	Non-allergic rhinitis with eosinophils
Drug-induced Rhinitis	Irritant Induced-rhinitis
- Rhinitis induced by topical vasoconstrictors (Chemical Rhinitis) - Rhinitis induced by non-steroidal anti-inflammatory drugs	Reactive upper airways dysfunction syndrome
	Idiopathic Rhinitis

Rhinitis induced by synthetic hormones
(contraceptives)
Rhinitis induced by vasodilators
Occupational Rhinitis
Rhinitis caused by work
Irritant Induced-rhinitis
Reactive upper airways dysfunction
syndrome
Corrosive Rhinitis
Rhinitis exacerbated by work
Irritant Induced-rhinitis
Non-allergic rhinitis with eosinophils
Idiopathic Rhinitis
Mixed rhinitis

Mixed rhinitis

Rhinosinusitis

Chronic rhinosinusitis

Chronic Rhinosinusitis with Nasal Polyposis

Chronic Rhinosinusitis without Nasal Polyposis

Samter's syndrome

Incl.: Widal Syndrome, Widal Triad

Miscellaneous forms of rhinosinusitis

Allergic Fungal Rhinosinusitis

Chronic rhinosinusitis

Chronic maxillary sinusitis

Chronic frontal sinusitis

Chronic ethmoidal sinusitis

Chronic sphenoidal sinusitis

Chronic pansinusitis

Samter's syndrome

Incl.: Widal Syndrome, Widal Triad

Allergic Aspergillus rhinosinusitis

Hypersensitivity/Allergic disorders involving the lower respiratory tract**Asthma**

Allergic Asthma

Incl.: Allergen-induced Asthma

Occupational Asthma

Allergic Occupational Asthma

Asthma

Allergic asthma

Non-allergic asthma

Other and unspecified asthma

Other specified asthma

Aspirin-induced asthma

Exercise-induced bronchospasm

Cough variant asthma

Other asthma

Samter's syndrome

Unspecified asthma

Unspecified asthma with exacerbation

Unspecified asthma with status asthmaticus

Unspecified asthma, uncomplicated

Drug-induced bronchospasm

Bronchospasm provoked by allergy to food substance

Hypersensitivity Pneumonitis

Hypersensitivity pneumonitis due to specific organic dust

Allergic bronchopulmonary aspergillosis

Hypersensitivity Pneumonitis

Hypersensitivity pneumonitis due to specific organic dust

Farmer lung

Bagassosis

Bird fancier lung

Suberosis

Maltworker lung

	Mushroom-worker lung Maple-bark-stripper lung Air-conditioner and humidifier lung Cheese washer's lung Coffee worker's lung Fishmeal worker's lung Grainhandler's disease or lung Pituitary-snuff-taker's disease Red-cedar lung or pneumonitis Wood lung or pneumonitis Silo-filler's disease Aspergillus-induced allergic or hypersensitivity conditions Allergic Aspergillus rhinosinusitis Maltworker lung Allergic bronchopulmonary aspergillosis
Hypersensitivity/Allergic disorders involving the eye Conjunctivitis Allergic Conjunctivitis <i>Incl.: Allergen-induced Conjunctivitis</i> Seasonal Allergic Conjunctivitis Perennial Allergic Conjunctivitis Vernal Keratoconjunctivitis Atopic keratoconjunctivitis Contact blepharoconjunctivitis <i>Incl: Allergic contact conjunctivitis</i>	Allergic or hypersensitivity disorders involving the eye Allergic conjunctivitis Vernal keratoconjunctivitis Giant papillary conjunctivitis Atopic keratoconjunctivitis Allergic conjunctivitis due to drugs and medicaments Irritant contact blepharoconjunctivitis

Occupational allergic conjunctivitis

Conjunctivitis due to drugs and medicaments

Hypersensitivity/ Allergic disorders involving skin and mucous membranes

Atopic Eczema

Incl: Atopic Dermatitis

Atopic dermatitis exacerbated by allergens

Atopic dermatitis exacerbated by food allergens

Atopic dermatitis exacerbated by inhaled allergens

Atopic dermatitis exacerbated by contact allergens

Atopic dermatitis due to other allergen

Atopic dermatitis exacerbated by topical irritants

Atopic dermatitis exacerbated by infection

Atopic Dermatitis with special manifestation

Allergic or hypersensitivity disorders involving skin and mucous membranes

Atopic eczema

Infantile atopic eczema

Infantile atopic eczema: impetiginization

Childhood atopic eczema

Childhood atopic eczema: flexural

Childhood atopic eczema: nummular pattern

Childhood atopic eczema: chronic lichenified

Childhood atopic eczema: generalized erythematous

Childhood atopic eczema: prurigo pattern

Childhood atopic eczema: impetiginization

Adult atopic eczema

Adult atopic eczema: flexural

Adult atopic eczema: nummular pattern

Adult atopic eczema: chronic lichenified

Adult atopic eczema: generalized erythematous

Adult atopic eczema: prurigo pattern

Adult atopic eczema: impetiginization

Atopic eczema: special forms

Atopic dermatitis with nummular pattern
Atopic dermatitis with liquenification
Atopic dermatitis with generalization
Incl: Atopic Erythroderma

Atopic cheilitis
Atopic eczema of eyelids
Atopic eczema of the hands
Atopic eczema: photoaggravated
Atopic xeroderma

Contact Dermatitis

Allergic Contact Dermatitis
Occupational Allergic Contact Dermatitis

Allergic Contact dermatitis by site
Systemic Allergic Contact Dermatitis
Incl: Erythroderma
Localized Allergic Contact Dermatitis

Photoallergic Contact Dermatitis

Allergy to substances in contact with the skin

Allergic contact dermatitis
Occupational allergic contact dermatitis
Allergic contact dermatitis due substantially to occupational exposure to allergen
Allergic contact dermatitis due in part to occupational exposure to allergen
Allergic contact dermatitis organized by allergen class (covers 17 entities)
Allergic contact dermatitis organized by site (covers 12 entities)

Photo-allergic contact dermatitis

Incl: Photosensitive Dermatitis

Other forms of dermatitis

Dyshidrosis

Nummular dermatites

Photo-allergic contact dermatitis organized by photo-allergen class
(covers 6 entities)

Occupational photo-allergic contact dermatitis

Allergic contact urticaria

Allergic contact urticaria: localized

Allergic contact urticaria: disseminated

Oral allergy syndrome

Occupational allergic contact urticarial

Contact urticarial due to food allergen

Protein contact dermatitis

Protein contact dermatitis due to plant protein

Protein contact dermatitis due to animal protein

Occupational protein contact dermatitis

Exacerbation of constitutional dermatitis due to exposure to contact allergens

Cutaneous reactions to systemic exposure to contact allergens

Systemic contact dermatitis due to ingested allergen

Symmetrical drug-related intertriginous and flexural erythema

Systemic contact dermatitis due to implanted allergen

Certain specified allergic reactions to substances in contact with skin and mucous
membranes

Allergic contact sensitization

	Allergic contact sensitization organized by allergen class (covers 15 entities) Allergic contact sensitization due to occupational exposure to allergen
Urticaria Acute Urticaria Allergen-induced urticaria Acute urticaria isolated Acute urticaria with anaphylaxis Chronic Urticaria Chronic Spontaneous Urticaria Chronic autoimmune urticaria Chronic urticaria due to underlying infection or infestation Chronic urticaria exacerbated by drugs Chronic urticaria due to unspecified cause Allergic Contact Urticaria by site Local allergic contact urticaria Systemic allergic contact urticaria Oral allergy syndrome Nonallergic Urticaria	Urticaria, angioedema and other urticarial disorders Spontaneous urticaria Acute urticaria Acute urticaria due to IgE-mediated allergy Acute urticaria due to underlying infection or infestation Acute urticaria due to pseudoallergy Acute urticaria due to other specified mechanism Acute urticaria of undetermined aetiology Chronic urticaria Chronic autoimmune urticaria Chronic urticaria due to underlying infection or infestation Chronic urticaria due to pseudoallergy Chronic urticaria due to other specified mechanism Chronic urticaria of undetermined aetiology Contact urticaria Allergic contact urticaria Allergic contact urticaria: localized Allergic contact urticaria: disseminated Oral urticaria syndrome Occupational allergic contact urticaria

Incl.: Inducible Urticaria, Non-allergen induced urticaria

Physical Urticaria

Dermographism/Urticaria factitia

Cold contact urticaria

Delay pressure urticaria

Heat contact urticaria

Solar urticaria

Vibratory urticaria

Other inducible urticarias

Aquagenic urticaria

Cholinergic urticaria

Exercise induced urticaria

Angioedema

Allergic angioedema

Incl.: Allergen-induced angioedema

Angioedema isolated

Angioedema with urticaria

Contact urticaria due to food allergen

Non-allergic contact urticaria

Occupational non-allergic contact urticaria

Physical urticaria and angioedema

Dermographism

Cold urticaria

Heat contact urticaria

Vibratory angioedema

Solar urticaria

Cholinergic urticarial and related conditions

Cholinergic urticaria

Cholinergic pruritus

Cholinergic erythema

Exercise-induced anaphylaxis

Food-dependent exercise-induced anaphylaxis

Miscellaneous urticarial disorders

Aquagenic urticaria

Angioedema

Urticaria

Urticarial vasculitis

Anaphylaxis due to radiocontrast media

Syndromes with urticarial reactions or angioedema

Cryopyrin-associated periodic syndromes

Schnitzler syndrome

Angioedema with anaphylaxis Non-allergic angioedema Incl.: Non-allergen induced angioedema Bradikinines induced-angioedema Hereditary angioedema Hereditary angioedema type I Hereditary angioedema type II Hereditary angioedema type III Incl.: Hereditary angioedema with FXII mutation Acquired angioedema Acquired angioedema type I Acquired angioedema type II Angioedema due to drugs Angioedema due to angiotensin converting enzyme (ACE) inhibitor Angioedema due to non-steroidal anti-inflammatory drugs	Episodic angioedema with eosinophilia Tumour necrosis factor receptor 1 associated periodic syndrome Angioedema due to disordered complement Hereditary angioedema Hereditary angioedema type I Hereditary angioedema type II Hereditary angioedema type III Incl.: Hereditary angioedema with FXII mutation Acquired angioedema Acquired angioedema type I Acquired angioedema type II Drug-induced urticarial, angioedema and anaphylaxis Drug-induced urticaria Drug-induced angioedema Angioedema due to angiotensin converting enzyme inhibitor Drug-induced anaphylaxis
Anaphylaxis Anaphylaxis classified by clinical severity	Anaphylaxis Anaphylaxis classified by clinical severity (extension codes)

Anaphylaxis grade 1 [single system]

Anaphylaxis grade 2 [more than one system; not life-threatening]

Anaphylaxis grade 3 [more than one system; life-threatening]

Anaphylaxis grade 4 [life-threatening with cardiac arrest]

Anaphylaxis due to food proteins

Incl: Food-induced anaphylaxis, food allergen-induced anaphylaxis

Anaphylaxis due to drugs and medicaments

Incl: Drug-induced anaphylaxis

Anaphylaxis due insect venom

Incl.: Insect venom allergen-induced anaphylaxis

Anaphylaxis due to inhaled allergens

Incl.: Inhaled allergen-induced anaphylaxis

Anaphylaxis due to contact with allergens

Incl.: Contact allergen-induced anaphylaxis

Anaphylaxis provoked by physical factors

Cold-induced anaphylaxis

Anaphylaxis grade 1 [single system]

Anaphylaxis grade 2 [more than one system; not life-threatening]

Anaphylaxis grade 3 [more than one system; life-threatening]

Anaphylaxis grade 4 [life-threatening with cardiac arrest]

Anaphylaxis due to allergic reaction to food

Food-dependent exercise-induced anaphylaxis

Drug-induced anaphylaxis

Anaphylaxis due to insect venom

Anaphylaxis due to inhaled allergens

Anaphylaxis due to contact with allergens

Anaphylaxis provoked by physical factors

Cold-induced anaphylaxis

Exercise-induced anaphylaxis Exercise-induced anaphylaxis dependent on food Anaphylaxis secondary to mast cell disorder <i>incl.: Mastocytosis</i> Other specified anaphylaxis	Exercise-induced anaphylaxis Food-dependent exercise-induced anaphylaxis Anaphylaxis secondary to mast cell disorder
Complex hypersensitivity/allergic disorders	Complex hypersensitivity/allergic disorders
Drug Hypersensitivity <i>Incl.: Drug allergy, non-allergic hypersensitivity drug reaction</i> Drug-induced eruptions Drug-induced exanthema Drug-induced urticaria Drug-induced angioedema Drug fixed eruption <i>Incl.: Fixed drug eruption</i> Drug-induced multiform erythema Drug-induced contact dermatitis Contact dermatitis due to topical medications Contact dermatitis due to systemic antibiotics Drug-induced photoallergic contact dermatitis Drug-induced blistering diseases Drug-induced Stevens-Johnson syndrome Drug-induced Toxic Epidermal Necrolysis Drug-induced Stevens-Johnson syndrome/Toxic	Drug Hypersensitivity Drug eruptions Exanthematic drug eruption Drug-induced urticaria Drug-induced angioedema Fixed drug eruption Limited fixed drug eruption Generalized fixed drug eruption Allergic contact dermatitis due to topical medicaments Allergic contact dermatitis due to systemic medicaments Eczematous drug eruption Lichenoid drug eruption Stevens-Johnson syndrome and toxic epidermal necrolysis due to drug Drug-induced Stevens-Johnson syndrome Drug-induced Toxic Epidermal Necrolysis Drug-induced Stevens-Johnson syndrome/Toxic Epidermal Necrolysis

Epidermal Necrolysis

Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) - DIHS

Drug-induced Acute Generalized Exanthematous Pustulosis (AGEP)

Systemic drug-related intertriginous and flexural exanthema (SDRIFE)

Drug-induced vasculitis

Drug-induced erythroderma

Drug-induced Erythema Nodosum

Other specified drug eruption

Drug-induced systemic reactions

Drug-induced anaphylaxis

Specific systemic reactions due to drug hypersensitivity

Incl.: Drug-induced organ reactions

Drug-induced hepatitis

Drug-induced cytopenia

Drug-induced bronchospasm

Drug-induced rhinitis

Drug-induced conjunctivitis

Drug-induced vasculitis

Drug-induced blistering diseases with systemic commitment

Drug-induced Stevens-Johnson syndrome

Drug-induced Toxic Epidermal Necrolysis

Drug-induced Stevens-Johnson syndrome/Toxic

Epidermal Necrolysis

Drug Reaction with Eosinophilia and Systemic

Symptoms (DRESS) - DIHS

DRESS syndrome

Acneform and pustular eruptions due to drug

Drug-associated immune complex vasculitis

Drug-induced erythroderma

Drug-induced erythema nodosum

Miscellaneous specified cutaneous eruptions due to drugs

Specific organ or system reaction due to drug hypersensitivity

Drug-associated immune-complex arthritis

Drug-induced aplastic anaemia

Drug-induced liver hypersensitivity disease

Drug-induced cytopenia

Drug-induced bronchospasm

Drug-induced rhinitis

Allergic conjunctivitis due to drugs and medicaments

Drug-induced vasculitis

Aspirin-induced asthma

Multiple drug hypersensitivity syndrome	Samter's syndrome Multiple drug hypersensitivity syndrome
Food Hypersensitivity <i>Incl:</i> Food Allergy, food allergen-induced hypersensitivity Food-induced urticaria/Angioedema <i>Incl.:</i> Food allergen-induced urticaria/angioedema Contact urticaria due to food allergen <i>Incl.:</i> Food allergen-induced contact urticaria Food-induced anaphylaxis <i>Incl.:</i> Food allergen-induced anaphylaxis Food-associated, exercise-induced anaphylaxis Oral allergy syndrome <i>Incl.:</i> pollen-associated food allergy syndrome Food-induced gastrointestinal hypersensitivity <i>Incl.:</i> Food allergen-induced gastrointestinal hypersensitivity Food-induced immediate Gastrointestinal hypersensitivity Food-induced eosinophilic esophagitis Food-induced eosinophilic gastroenteritis Food-protein induced enterocolitis syndrome Food protein-induced allergic proctocolitis Atopic dermatitis exacerbated by food allergens Allergic contact dermatitis due to food allergen	Food hypersensitivity Food-induced urticarial or angioedema Contact urticarial due to food allergen Anaphylaxis due to allergic reaction to food Food-dependent exercise-induced anaphylaxis Bronchospasm provoked by allergy to food substance Oral allergy syndrome Allergic contact dermatitis due to food allergen Food-induced gastrointestinal hypersensitivity Food-induced eosinophilic gastroenteritis Food-induced eosinophilic oesophagitis Allergic and dietetic colitis Food-induced proctocolitis or colitis of infants Allergic and dietetic enteritis of small intestine IgE-mediated allergic enteritis of small intestine Eosinophilic enteritis Food-protein induced enterocolitis syndrome
Hymenoptera and other insects hypersensitivity/allergy	Hymenoptera and other insects hypersensitivity or allergy

Incl.: Insect venom allergen-induced hypersensitivity Cutaneous Reaction due to Hymenoptera venom and other insect allergy Cutaneous reaction due to Hymenoptera venom allergy Systemic Reaction due to Hymenoptera venom <i>Incl.: Anaphylaxis due to Hymenoptera venom</i>	Systemic allergic reaction due to Hymenoptera venom Anaphylaxis due to insect venom Cutaneous reactions to Hymenoptera venom Cutaneous reactions to arthropods Insect bites and stings (covers 9 entities) Arachnid bites and stings (covers 7 entities) Other cutaneous reactions to arthropods
	Allergic or hypersensitivity disorders involving the gastrointestinal tract Allergic gastritis Allergic gastritis due to IgE-mediated hypersensitivity Food-induced IgE-mediated gastrointestinal hypersensitivity Allergic gastritis due to non-IgE-mediated hypersensitivity Food-induced non-IgE-mediated gastrointestinal hypersensitivity Allergic duodenitis Allergic and dietetic colitis Food-induced proctitis or colitis of infants Food-induced eosinophilic gastroenteritis Food-induced eosinophilic oesophagitis Allergic and dietetic enteritis of small intestine IgE-mediated allergic enteritis of small intestine Eosinophilic enteritis Food-protein induced enterocolitis syndrome

AUTHOR CONTRIBUTIONS’:

Luciana Kase Tanno and Pascal Demoly contributed to the construction of the document (designed the study, analyzed and interpreted the data, and wrote the manuscript). Moises A Calderon contributed in tuning the document and with the revision of the manuscript.

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The authors declare that they do not have any conflict of interests related to the contents of this article.

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