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- Shah NS, Ridgway JP, Pettit N, Fahrenbach J, Robicsek A. Documenting Penicillin Allergy: The Impact of Inconsistency. PLoS One. 2016;11:e0150514.
- Daulat S, Solensky R, Earl HS, Casey W, Gruchalla RS. Safety of cephalosporin administration to patients with histories of penicillin allergy. J Allergy Clin Immunol. 2004;113:1220-1222.
- Jeffres MN, Narayanan PP, Shuster JE, Schramm GE. Consequences of avoiding beta-lactams in patients with beta-lactam allergies. J Allergy Clin Immunol. 2016;137:1148-1153.
- 7. Romano A, Atanaskovic-Markovic M, Barbaud A, et al. Towards a more precise diagnosis of hypersensitivity to beta-lactams an EAACI

- position paper. *Allergy*. 2019. https://doi.org/10.1111/all.14122. [Epub ahead of print].
- Van Gasse AL, Ebo DG, Chiriac AM, et al. The limited value of prolonged drug challenges in nonimmediate amoxicillin (clavulanic acid) hypersensitivity. J Allergy Clin Immunol Pract. 2019;7(7):2225-2229.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

DOI: 10.1111/all.14293

Definition, aims, and implementation of GA²LEN/HAEi Angioedema Centers of Reference and Excellence

To the Editor,

GA²LEN, the Global Allergy and Asthma European Network, and HAE international (HAEi), the global umbrella organization for the world's hereditary angioedema (HAE) patient groups, have launched their joint ACARE (Angioedema Center of Reference and Excellence) program, within GA²LEN's center of reference and excellence (CORE) initiative. Angioedema is a common, heterogeneous, often debilitating and chronic condition and is frequently a challenge for physicians and affected patients, especially patients suffering from recurrent attacks. Additionally, it can be a challenge for some patients to understand the underlying etiology of their angioedema (Table 1). GA²LEN's CORE networks, such as UCARE for urticaria and ADCARE for atopic dermatitis, help to improve the management of difficult-to-treat conditions. Here, we describe the aims, requirements, provisions, application process, audit, and accreditation

protocol for GA²LEN/HAEi ACAREs. ACAREs aim to provide excellence in angioedema management, increase the knowledge of angioedema through research and education, and promote advocacy activities that raise angioedema awareness. To become a certified ACARE, angioedema centers must fulfill 32 requirements, defined by specific provisions that will be assessed during an audit visit. The ACARE program will result in a strong network of angioedema specialists, promote angioedema research and awareness, and harmonize and improve angioedema management globally. ACAREs will expand access to modern angioedema medicines in countries where they are available and help to bring them to countries where they are not.¹

This document summarizes the aims of GA²LEN/HAEi Angioedema Centers of Reference and Excellence (ACAREs) and elaborates the requirements that ACAREs must fulfill to become

TABLE 1 Classification of angioedema

Bradykinin	-mediated an	gioedema		Mast cell mediator-mediated angioedema		Unknown mediator	
C1-INH det	ficiency/	C1-INH normal		IgE mediated	Non-IgE mediated		
Inherited	Acquired	Inherited	Acquired				
HAE-1 HAE-2	AAE-C1- INH	HAE nC1-INH (HAE- FXII, HAE-ANGPTI, HAE-PLG, HAE- KNG1, HAE-UNK)	AE due to medication that interferes with BK degradation, eg ACEi	Angioedema with or without wheals in patients with urticaria Anaphylaxis	Angioedema with or without wheals in patients with urticaria	Idiopathic AE	

Abbreviations: AAE-C1-INH, acquired angioedema due to C1-inhibitor deficiency; ACEI-AE, angiotensin-converting enzyme inhibitor-induced angioedema; BK, bradykinin; HAE nC1-INH, hereditary angioedema with normal C1-inhibitor levels, either due to a mutation in factor XII (F12), angiopoietin-1 (ANGPT1), plasminogen (PLG), kininogen-1 (KNG1), or unknown (UNK) (HAE-FXII, HAE-ANGPTI, HAE-PLG, HAE-KNG1, HAE-UNK); HAE-1, hereditary angioedema due to C1-inhibitor deficiency; HAE-2, hereditary angioedema due to C1-inhibitor dysfunction.

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Aud	R Date:	Head of the Center:		Network of Excell	ence
Aud	ted Center:		of antiferen		
Aus	Hor:	Deputy head(s):	n(t)	00	
Last	rodit:	077	stadensu(m)	НА	Fi
				1945 Inte	netional
		tefrastructure / Sc			_
	Equirement	Explanation	Deliverable(s)	Yes /No	Calc
1.	Hospital setting or affiliation	Corsor needs to be in a hospital or affiliated with a hospital with inpatient facilities to allow for extended diagnostic work so and reanagement of exceptation	Evidence of hospital setting or affiliation with hospital	0 0	*
2.	Outpatient clinic with clinic hours for angloedema patients headed by	Center needs to have designated and expert leadership (experienced specialist physician) and to	Lead by experienced physician (board certified specialist)		
	expert	offer a minimum number of consultation hours per week for angioedents patients	b4 h/ week of clinic time for angioedema patients (physician contact time)	0 0	A
3.	Open to children and adult patients	Centers need to be able to provide core for angioedema patients of any aga, either by center stat or affiliated specialists	Evidence that engloadema patients of any age are provided with state of the art care	0 0	ь
4.	Team of dedicated staff, with	Center staff needs to comprise more than one	£2 physicians and £1 name	0	
	specific angloedema training	physician and at least one sure. All center staff need to be sancifically and regularly trained in assigndenta		0.0	Α.
			staff reember per year, e.g. 6t/18% sahool on angloedema, angloedema CME activity, str.		^
5.	Multidodylinery approach	Center needs to be able to interact with other specialties for the management of comorbidities, the	Evidence of interaction with other specialists		
		treatment of patients with differential diagnosis, and to perform intreded diagnostics.	ľ.		В
6.	Accessibility and visibility	Angioedema patients need to be able to find the center via information on the web: center needs to	Center clinic hours are posted on website	0 0	
		have referral network(s) of physicians; center needs to	Evidence of local referral network	0 0	В
		work with patient association() I, where applicable	Evidence that patient organization recommends the center	0 0	
7.	Communication skills	Center staff needs to be able to communicate adequately with angioedoma patients in national	Proof of adequate communication skills by interview with center staff		
		language and in English	THE PER SECTION AND THE		
8.	Quality management	Conton needs to have Quality Management (CMI)	Evidence of presence of QM system	0 0	
		system in place, need to have written protocols and standard operating procedures (SCPs)	Proof of presence and use of SOPs/ endeces.	0 0	8
s.	Structured documentation,	Center needs to have in place and use a databank to	Fotient databank	0 0	
	recording and archiving of patient	record patient data. Databank seeds to allow retriesor of information product to address wheelth or entireso.		0.0	A
_			fatabank/vear		
23.	Critical incidence reporting and	Contac seeds to have and make use of an incidence arount have documenting all critical incidents. Contac	Evidence of precesce and use of incidence report book and follow up and	0 0	
		must analyze all reported incidents and take and document appropriate action	documentation of error reports by appropriate action		8
11.	Accessment of participal subblaction	Center needs to regularly assess have satisfied	Proof that 540 patients were asked about	0 0	
	and unmet needs	angloedema patients are with the work of the center and take appropriate action based on the outcome	their satisfaction in last 12 months (preferably by questionnaire)		В
12.	In team communication	Center needs to have regular meetings of staff to discuss projects and concepts. Decisions should be	Evidence of regular team meetings, at	0 0	
		protocolled and followed by action where applicable.	least once per month, on center logistics, projects and concepts		

34	Support of the ACARS sotwork	Training and activities in auditing and certifying GAYLEN/NASI ACARSI and interaction with other ACARSI.	Letter of intent to serve as a GA*LEN/NAC! ALARS auditor and to contribute to ALARS setwork activities, projects, and meetings	0 0	A
15.	"Never give up" attitude	Staff needs to exhibit high motivation to help angioedenia patients and share understanding that they may be the last resert of patients. Staff needs to convey to patients, that they are in good care and that the center will help them, loower hand this may be.	Evidence of "never give up" a tritude by staff intreview	0 0	в
		Management			
	Requirement	Eiglanation	Deliverable(s)	Yes /No	CK
35.	Knowledge of and adherence to international guidelines* and conserves decuments* for engineering	All center staff members need to know the current vendors of these international guidelines and their semesponding national guidelines, if available. Center approach to engleddema needs to be based on	international guidelines and consensus documents for angioedema are present (pager / electronic sension ²)	0 0	
		guideline recommendations.	Center staff can answer questions on guideline recommendations	0 0	٨
			Center physicians can show, by use of a patient file, that management decision are based on guideline recommendations		
17.	Knowledge and use of current nomenclature and classification of angioedensa	Contensial reach to know and use the current angloedema classification and nomenciature	Evidence that stell uses current angioedems nonneclature and classification**, e.g. by interview and/or patient file review.	0 0	A
18.	Knowledge and use of guided history taking/becomesis	Structured history taking by center physicians is eccertial and a shecklist can facilitate this	Checklist for history taking needs to be present and used as evidenced by interview or ongoodems patient file toview.	0 0	٨
25.	Knowledge and use of differential chagnostic algorithm	Center physicians need to be aware of the differential diagnoses of angioesterns and know how not to miss their.	Differential diagnostic algorithm* seeds to be present and used as endenced by interview or angioedoma partient file traview.	0 0	A
30.	Standardood assessments and monitoring of disease activity, impact and central of disease	The use of instruments for assessing disease activity, impact and control allows for standardized measurements and monitoring of patients can help to optimize angiocómne mesagement.	AAS', AE-Qui, 14, AECT or other validated tools for the assessment of angioedema disease activity, impact and central need to be present and used	0 0	A
			At least one of them needs to be used in 80% of recurrent assignment outliness		
21.	identification of camorbidities and underlying causes	Center needs to have access to and use measures to identify committed and causes of chronic recurrent angloedems, for example C3 inhibitor testing and genetic testing.	Evidence that diagnostic measures for angioedenia comorbidities and underlying sauces are used, e.g. C4 and C1 inhibitor tests, genetic testing	0 0	۸
22.	Family screening and pedigree charting	In patients with hereditary angloedema, all first- degree family members need to be screened and a	Standardized documentation of family screening and pedigree charting	0 0	
		pedigree (a family tree) needs to be prepared, SOPs are needed as is the use of appropriate instruments for pedigree charting and updating.	Instrument / techniques are available and used as evidenced by patient file reviews		A
23.	Knowledge and use of therapeatic algorithm	Conter physicians need to knew and apply therapeutic guideline algorithms.	Evidence that stelf uses current, therapeutic algorithms for the treatment of parients with angioedenia, e.g. by intension and/or patient file review.	0 0	А
34.	Counseling	Counseling of patients and their families, for example on triggers of expectitation, on emergency medication/viscources, dely life issues cen help to optimize anglocolens management.	Evidence that angioedema gaslents receive courseling, e.g. by interview antifor patient file review	0 0	А

		Research			
	Fequirement	Explanation	Deliverable(s)	Yes/No	Cet
25.	Scienzific orienzation	Center staff needs to be up-to-date with the literature on enginedome, especially on pelhogenesis, for example by perticipation in journal clob, attenting annual meetings of scientific societies, membership in scientific occieties.	Syldence of knowledge of the current anginedense literature, e.g. by interview.	0 0	- 4
36.	Scientific activity	Angloedema research activities in basic science, clinical science, translational science, epidemiology, and/or public health	Evidence of scientific activities and projects on angioederna	0 0	- 4
27.	Scientific productivity	Center needs to show that its research activities result in publications and other scientific output.	8.5 peer reviewed publication on angiaedensa per year per center physician.	0 0	- 4
28.	Clinical trials	Center needs to participation in clinical trials, pharma- and/far investigator-initiated; diagnostic and/far thenipeutit trials on angioedema	8.5 trials in angioedema per year per senter physician	0 0	- 4
29.	Participation in registry	Registrios can help to better understand angioedensa. Center recels to participate in international, national, and/or regional registry activities, e.g. CURE [®]	Evidence that center extest data on angrecitime patients in a registry		- 4
_		Education			
-	Sendoment .	Evaluation	Dellumahistol	Yes Alia	Ce
33.	Educational activities	Center needs to conditione to the education of phasicians who see patients with onglooderms, e.g. dermotologists, allegists, it (Reydicans, podiations), general practisoners and family physicians, and of medical students, residents, patients, and the general public.	Evidence of 1 educational activity on angionderns per year for physicians and 1 per year for gatients.	0 0	
		Advocacy			
	Regiment	Advocacy	Deliverational	Yes /No	Ge
31.			Deliverable(s) Evidence of 1 whosesy /owireness activity on implications per year	Yes /No	Car A

Will result:	Area	All requirements fulfilled, no areas with a need for further improvement, center should be certified. All requirements fulfilled, some areas require further improvement, center should be certified with a need for further improvement:
	0	Most requirements fulfilled, center should be centified after providing documentation than the following requirements are fulfilled
		□ re-audit in months

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FIGURE 1 A and B, Audit checklist for GA²LEN/HAEi Angioedema Center of Reference and Excellence (ACARE) certification (A) and certificate awarded to GA²LEN/HAEi ACAREs upon a successful audit (B). A, The list shows and explains the requirements for becoming a G^{A2}LEN/HAEi ACARE and the deliverables that are reviewed during the audit process. B, The certificate is awarded for 2 y and requires successful re-audit to be extended

certified. It also provides (see Appendix S1) background information on GA²LEN and HAEi, including HAEi member organizations and regional patient advocates, on why we need an Angioedema Center of Reference and Excellence (ACARE) program and network, and on the accreditation and certification process, governance and funding, and on the interaction with other GA²LEN networks of centers of reference and excellence. The protocols, aims, requirements, and provisions related to becoming a certified ACARE are based on (a) the experience of the GA²LEN UCARE network and (b) input from angioedema patients, general practitioners, and angioedema specialists.

What are the aims of GA²LEN/HAEi ACAREs? The aims of ACAREs are to set the global standard for excellence in comprehensive angioedema care through research, education, advocacy, and interaction among ACAREs. By serving as referral centers for the diagnosis and management of patients with angioedema, ACAREs will complement the local healthcare system. ACAREs aim to increase knowledge and awareness of angioedema.

What are the requirements for GA²LEN/HAEi ACAREs? ACAREs are required to demonstrate excellence in the management of angioedema, research activities, efforts in education, and advocacy activity. ACAREs need to fulfill 32 requirements, which are explained in the audit checklist (Figure 1A). This checklist includes specific deliverables for each requirement. For example, the requirement to know and follow international guidelines and consensus documents for angioedema (Requirement #16) entails that physicians and other ACARE healthcare professionals have read and understood the current versions of these guidelines and consensus documents and that their recommendations are implemented in their center.

These guidelines and consensus documents include, for example, the international WAO/EAACI guideline for HAE, the EAACI/GA²LEN/EDF/WAO guideline for urticaria, the International/Canadian hereditary angioedema guideline, ²⁻⁵ the international consensus on the diagnosis and management of pediatric patients with hereditary angioedema with C1 inhibitor deficiency, the international consensus on the use of genetics in the management of HAE, ⁶ and the international consensus and practical guidelines on the gynecologic and obstetric management of female patients with hereditary angioedema caused by C1 inhibitor deficiency. ⁷ The deliverables for this requirement are that (a) current guideline and consensus document versions are present (paper or electronic version) at the center, (b) ACARE staff can answer questions on the recommendations these documents provide, and (c) ACARE physicians can show, upon request, by use of a patient file, that patient

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management decisions are based on guideline recommendations (Figure 1B).

This publication marks our intent to start the implementation of the GA²LEN/HAEi ACARE initiative. Specialty centers for angioedema have started to apply to become ACAREs, and audits and certifications are ongoing (Figure 1B). We expect that most GA²LEN UCARE centers and many angioedema specialty centers will become ACAREs in the near future. We predict and hope that by 2022, GA²LEN/HAEi ACAREs will be established in every continent. This will result in a strong global network of angioedema specialists, promote angioedema research, and harmonize and improve angioedema management worldwide. GA²LEN and HAEi will measure the impact of ACAREs over time and document and report the benefits of this initiative. ACARE network activities and a current list of ACAREs are posted on the network's website (www.acare-network.com).

ACKNOWLEDGMENTS

The GA²LEN/HAEi ACARE is supported by its twin network, the GA²LEN UCARE network (www.ga2len-ucare.com). We thank Beate Schinzel for expert help with formatting and revising the manuscript as well as its submission.

CONFLICT OF INTEREST

Dr Maurer reports grants and personal fees from Allakos, personal fees from Aralaz, grants and personal fees from AstraZeneca, grants and personal fees from BioCryst, grants from Blueprint, grants and personal fees from CSL Behring, grants and personal fees from FAES, grants and personal fees from Genentech, grants from Kalvista, grants from Lilly, grants from Menarini, grants and personal fees from Novartis, grants from Leo Pharma, grants from Moxie, grants from Pharming, personal fees from Pharvaris, grants and personal fees from Roche, from Sanofi, grants and personal fees from Shire/ Takeda, grants and personal fees from UCB, grants and personal fees from Uriach, outside the submitted work. Dr Aberer reports other from Takeda, other from CSL Behring, outside the submitted work. Dr Ansotegui reports personal fees from Mundipharma, personal fees from Roxall, personal fees from Sanofi, personal fees from MSD, personal fees from Faes Farma, personal fees from Hikma, personal fees from Astra Zeneca, personal fees from Stallergens, outside the submitted work. Dr Aygören-Pürsün reports personal fees from Adverum, grants and personal fees from BioCryst, grants and personal fees from CSL Behring, grants and personal fees from Kalvista, personal fees from Pharming, grants and personal fees from Shire/ Takeda, during the conduct of the study. Dr Banerji reports grants from Takeda, BioCryst, personal fees from Takeda, BioCryst, CSL, Pharming, Pharvaris, Kalvista, outside the submitted work. Dr Aberer reports other from Takeda, other from CSL Behring, outside the submitted work. Dr Bernstein reports grants and personal fees from Shire/Takeda, grants and personal fees from CSL Behring, grants and personal fees from BioCryst, grants and personal fees from Kalvista, grants from IONIS, grants and personal fees from Novartis/ Genentech, grants and personal fees from Astra Zeneca, grants and personal fees from Sanofi Regeneron, from HAEA MAB, during the

conduct of the study. Dr Betschel reports personal fees from CSL Behring, personal fees from Takeda/Shire, during the conduct of the study; personal fees from Octapharma, grants from Green Cross, personal fees from Novartis, personal fees from CADTH, outside the submitted work; and Chair of the Canadian Hereditary Angioedema Network. Dr Bork reports personal fees from CSL, personal fees from Shire, outside the submitted work. Dr Busse reports personal fees from CSL Behring, grants and personal fees from Shire, personal fees from Pharming, personal fees from Pearl Therapeutics, personal fees from BioCryst, personal fees from CVS Health, personal fees from Novartis, personal fees from Law offices of Levin, Riback, Adelman and Flangel, outside the submitted work. Dr Bygum reports grants and other from CSL Behring, grants and other from Shire/ TAKEDA, other from ViroPharma, from HAE Scandinavia, outside the submitted work. Dr Caballero reports personal fees and other from BioCryst, personal fees, non-financial support and other from CSL-Behring, personal fees from Merck, personal fees and other from Novartis, personal fees from Octapharma, personal fees, nonfinancial support and other from Shire HGT, personal fees and other from Pharming NV, outside the submitted work. Dr Campos reports and Personal fees for consulting and lectures from Takeda. Dr Cancian served for Scientific Advisory Boards, and received travel grants, for/from CSL Behring and Shire-Takeda. His Institution (Department of Medicine, University of Padua, Italy) received grants from CSL Behring and Shire-Takeda. Dr Cohn reports personal fees from Takeda, personal fees from Pharming, personal fees from CSL, personal fees from BioCryst, outside the submitted work. Dr Craig reports grants, personal fees and other from CSL Behring, grants and personal fees from Dyax, grants, personal fees and other from Takeda, grants and personal fees from BioCryst, grants and personal fees from Pharming, personal fees from Grifols, grants and non-financial support from GSK, grants and non-financial support from Regeneron, grants and non-financial support from Novartis/ Genetech, outside the submitted work; and On the Medical Advisory Board for HAE-A of America, AAAAI Board, ALA Mid Atlantic Board. Dr Dissemond reports grants and personal fees from Novartis, outside the submitted work. Dr Du-Thanh reports personal fees from SHIRE/T. Dr Ensina reports personal fees from NOVARTIS, personal fees and non-financial support from TAKEDA, personal fees from SANOFI, outside the submitted work. Dr Farkas reports grants and personal fees from CSL Behring, grants and personal fees from Shire/Takeda, grants and personal fees from Pharming, personal fees from BioCryst, personal fees from Kalvista, outside the submitted work. Dr Gimenez-Arnau reports grants and personal fees from URIACH, grants and personal fees from NOVARTIS, personal fees from DSANOFI, grants from CARLOS III FEDER, personal fees from FAES, personal fees from GSK, personal fees from ALMIRALL, personal fees from ASTRA ZENECA, outside the submitted work. Dr Fukunaga reports personal fees from A Takeda company (Shire), personal fees from CSL Behring, outside the submitted work. Dr Gompels reports other from Speaker at Novartis Urticaria conference 2019, outside the submitted work; and A member of the Immunology Clinical reference group. Dr Gower reports grants,

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personal fees, research grants and other from Takeda/Shire/Dyax, research grants and other from BioCryst Pharmaceuticals, other from CSL Behring, other from Pharming, other from Fresenius kabi, outside the submitted work. Dr Grumach reports grants, personal fees and other from Shire/Takeda, personal fees and other from CSL Behring, outside the submitted work. Dr Hide reports grants and personal fees from Shire/Takeda, Mitsubishi-Tanabe, Taiho-yakuhin, personal fees from CSL-Behring, BioCryst, Novartis, Teikoku-Seiyaku, Eizai, Kaken, Kyowahakkou-Kirin, grants from Glaxo-Smith-Klein, outside the submitted work. Dr Jakob reports grants, personal fees and non-financial support from Novartis, personal fees and nonfinancial support from Thermo Fisher Scientific, grants and personal fees from ALK-Abello, personal fees from Celgene, personal fees and non-financial support from Bencard/Allergy Therapeutics, personal fees from Allergopharma, outside the submitted work. Dr Kaplan reports other from Genentech, other from Novartis, other from Sanofi Aventis, other from BioCryst, outside the submitted work. Dr Katelaris reports grants and personal fees from CSL Behring, grants and personal fees from Takeda, grants from BioCryst, during the conduct of the study. Dr Kleinheinz reports personal fees from Novartis, during the conduct of the study; personal fees from Abbvie, personal fees from Leo GmbH, personal fees from Janssen, personal fees from Medac, personal fees from Galderma, personal fees from Celgene, personal fees from Bencard, outside the submitted work. Dr Kocatürk reports personal fees from Novartis, personal fees from Sanofi, outside the submitted work. Dr Longhurst reports grants and personal fees from BioCryst, grants, personal fees and non-financial support from CSL Behring, grants from Ionis, grants from Kalvista, personal fees from Pharming, grants, personal fees and non-financial support from Takeda, personal fees from GSK, personal fees from Octapharma, outside the submitted work. Dr MacGinnitie reports personal fees from BioCryst, personal fees from Shire, outside the submitted work. Dr Magerl reports personal fees from CSL Behring, personal fees from Shire/part of Takeda, personal fees from Novartis, personal fees from BioCryst, personal fees from KalVista, personal fees from Pharming, outside the submitted work. Dr Makris reports personal fees from Novartis, outside the submitted work. Dr Marsland reports grants and personal fees from Novartis, personal fees and non-financial support from Sanofi, personal fees from Galderma, personal fees from Roche, non-financial support from Almirall, outside the submitted work. I. Martinez Saguer has received honoraria, research funding, and travel grants from BioCryst, CSL Behring, Pharming, and Takeda/Shire, KalVista and/or served as a consultant and/or participated in advisory boards for these companies. Dr Metz reports personal fees from Moxie, personal fees from Novartis, personal fees from Roche, personal fees from Sanofi, personal fees from Shire, outside the submitted work. Dr Papadopoulos reports personal fees from Novartis, personal fees from Nutricia, personal fees from HAL, personal fees from MENARINI/FAES FARMA, personal fees from SANOFI, personal fees from MYLAN/ MEDA, personal fees from BIOMAY, personal fees from AstraZeneca, personal fees from GSK, personal fees from MSD, personal fees from ASIT BIOTECH, personal fees from Boehringer Ingelheim, grants

from Gerolymatos International SA, grants from Capricare, outside the submitted work. Dr Reich reports personal fees from Abbvie, personal fees from Bioderma, personal fees from Chema Elektromet, personal fees from Galderma, personal fees from Bausch Health, personal fees from Janssen, personal fees from Leo Pharma, personal fees from Medac, grants and personal fees from Menlo Therapeutics, personal fees from Novartis, personal fees from Pierre-Fabre, personal fees from Trevi, personal fees from Kymab Limited, personal fees from MSD, personal fees from Metriopharm, personal fees from Drug Delivery Solutions, personal fees from Eli Lilly, outside the submitted work. 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D'dConsulting and honararia from Novartis, Novo, CSL Behring, Amgen., during the conduct of the study; grants from Novartis Pharmaceutical, grants from Genentech, grants from CSL behring, grants from Amgen, grants from Leo, grants from DBV, grants from Aimune, grants from Sanofi, non-financial support from Novartis, non-financial support from Novo, non-financial support from Pediapharm, non-financial support from Sanofi, grants from Kedrion, outside the submitted work. Dr Thomsen reports grants and personal fees from Novartis, grants and personal fees from Sanofi, grants and personal fees from UCB, grants and personal fees from Janssen, grants and personal fees from Abbvie, outside the submitted work. Dr Treudler reports personal fees from Shire-Takeda, personal fees from ALK-Abello, personal fees from Novartis, grants and personal fees from Sanofi-Genzyme, grants from Hautnetz Leipzig e.V., other from Fraunhofer Institut, outside the submitted work. Dr van Doorn reports personal fees from Leopharma, grants and personal fees from Novartis, personal fees from Abbvie, personal fees from BMS, personal fees from Celgene, personal fees from Lilly, personal fees from MSD, personal fees from Pfizer, personal fees from Sanofi-Genzyme, personal fees from Janssen Cilag, outside the submitted work. Dr Weber-Chrysochoou reports personal fees from Takeda and CSL Behring, outside the submitted work. Dr Zuberbier reports personal fees from AstraZeneca, personal fees from AbbVie, personal fees from ALK, personal fees from Almirall, personal fees from Astellas, personal fees from Bayer Health Care, personal fees from Bencard, personal fees from Berlin Chemie, personal fees from FAES, personal fees from HAL, personal fees from Leti, personal fees from Meda, personal fees from Menarini, personal fees from Merck, personal fees from MSD, grants and personal fees from Novartis, personal fees from Pfizer, personal fees from Sanofi, personal fees from Stallergenes, personal fees from Takeda, personal fees from Teva, personal fees from UCB, grants from Henkel, personal fees from Kryolan, personal fees from L'Oréal, outside the submitted work; and Organizational affiliations: Üommitee member: WHO-Initiative "Allergic Rhinitis and Its Impact on Asthma" (ARIA) Dember of the Board: German Society for Allergy and Clinical Immunology (DGAKI)Đead: European Centre for Allergy Research Foundation (ECARF) Decretary General: Global Allergy and Asthma European Network (GA2LEN)Dember: Committee on Allergy Diagnosis and Molecular Allergology, World Allergy Organization (WAO). 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[Correction Statement: Correction added on 20 May 2020 after first online publication: the author name has been corrected to Emel Aygören-Pürsün in this version.]

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REFERENCES

- Perego F, Wu MA, Valerieva A, et al. Current and emerging biologics for the treatment of hereditary angioedema. Expert Opin Biol Ther. 2019;19(6):517-526.
- Betschel S, Badiou J, Binkley K, et al. The International/Canadian hereditary angioedema guideline. Allergy Asthma Clin Immunol. 2019;15:72.
- Farkas H, Martinez-Saguer I, Bork K, et al. International consensus on the diagnosis and management of pediatric patients with hereditary angioedema with C1 inhibitor deficiency. Allergy. 2017;72(2): 300-313.
- Maurer M, Magerl M, Ansotegui I, et al. The international WAO/ EAACI guideline for the management of hereditary angioedema-the 2017 revision and update. World Allergy Organ J. 2018;11(1):5.
- Zuberbier T, Aberer W, Asero R, et al. The EAACI/GA(2)LEN/EDF/WAO guideline for the definition, classification, diagnosis and management of urticaria. *Allergy*. 2018;73(7):1393-1414.
- Germenis AE, Margaglione M, Pesquero JB, et al. International consensus on the use of genetics in the management of hereditary angioedema. J Allergy Clin Immunol Pract. 2020;8:901-911.
- Caballero T, Farkas H, Bouillet L, et al. International consensus and practical guidelines on the gynecologic and obstetric management of female patients with hereditary angioedema caused by C1 inhibitor deficiency. J Allergy Clin Immunol. 2012;129(2):308-320.

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