

European postgraduate curriculum in geriatric medicine developed using an international modified Delphi technique

KEY WORDS: Postgraduate training, geriatric medicine, consensus, curriculum, European Union

ABSTRACT

Background: The European Union of Medical Specialists (UEMS-GMS) recommendations for training in Geriatric Medicine were published in 1993. The practice of Geriatric Medicine has developed considerably since then and it has therefore become necessary to update these recommendations.

Methods: Under the auspices of the UEMS-GMS, the European Geriatric Medicine Society (EuGMS) and the European Academy of Medicine of Ageing (EAMA), a group of experts, representing all member states of the respective bodies developed a new framework for education and training of specialists in Geriatric Medicine using a modified Delphi technique. 32 expert panel members from 30 different countries participated in the process comprising three Delphi rounds for consensus. The process was led by five facilitators.

Results: The final recommendations include four different domains: “General Considerations” on the structure and aim of the syllabus as well as quality indicators for training (6 sub-items), “Knowledge in patient care” (36 sub-items), “Additional Skills and Attitude required for a Geriatrician” (9 sub-items) and a domain on “Assessment of postgraduate education: which items are important for the transnational comparison process” (1 item).

Conclusion: The current publication describes the development of the new recommendations endorsed by UEMS-GMS, EuGMS and EAMA as minimum training requirements to become a geriatrician at specialist level in EU member states.

BACKGROUND

The European Union (EU) commission regulates content on health workforce training within its core agenda. Chapter six of the Charter for training of medical specialists in the European Union, published in 1993 by the European Union of Medical Specialists (UEMS) [1] outlines recommendations for minimum requirements for postgraduate training in Geriatric Medicine. The Geriatric Medicine Section of the UEMS (UEMS-GMS) defined these requirements and they cover general aspects of training, requirements for institutions, teachers (trainers) and trainees as well as the competencies that need to be acquired to be a specialist in the subject. Built on a competency framework, the UEMS-GMS also published recommendations for a common pan-European curriculum for training in Geriatric Medicine. Given that the practice of the specialty has developed significantly since then and Geriatricians have expanded their roles, it has become necessary and timely to update these recommendations.

In a collaborative effort the UEMS-GMS, the European Geriatric Medicine Society (EuGMS) and the European Academy of Medicine Ageing (EAMA) decided to revise and update the current recommendations that were launched more than two decades ago.

Kern's six step approach [2] was adopted as this offers a structured method for curricular development. The initial step requires problem identification and a general needs assessment. To this end a team of experts from the three organisations involved in the process agreed to collate and analyse the currently available curricula published by different national societies and implemented in national training frameworks. Early on in this process it became clear that levels of competence as well as the content required to become a geriatrician differed considerably between different European countries, and indeed some had not yet established post-graduate training in the discipline [3]. Standardised comparison was only possible using a structured and widely agreed template for core competencies [4]. Introducing this template into an international comparative analysis process allowed a solid foundation for the development of widely approved recommendations for core competencies in postgraduate training of Geriatric Medicine across Europe.

METHODS

Using a similar recent procedure for developing recommendations for undergraduate training in Geriatric Medicine [5], the new recommendations for post-graduate training were developed using a modified Delphi technique [6,7]. The Delphi technique is a well-recognised consensus method used to determine the extent of agreement on an issue. The process generally includes the formation of a template for further rating, built on either a literature review or pre-existing data and a panel of experts undertaking a series of 'rounds' to identify, clarify, refine and finally to gain consensus. As the process is undertaken remotely, individuals can express their opinion without being influenced by others.

Template used

As a first step the developmental group of facilitators collected pre-existing national curricula for postgraduate training within the EU countries and mapped the contents of the curricula with the audit tool previously developed and published in 2016 [4]. In doing so it became clear, that due to the extensive differences in the structure, format and content of the curricula, it was impossible to extrapolate common core components from these national curricula to be used as a starting template for the Delphi process [3]. The facilitators therefore decided to use the previously validated and published audit instrument [4] itself

including additional items present in national curricula to start the process described in this paper (Appendix table1). This included 12 items on general considerations in domain I, 59 items on knowledge in patient care in domain II, 11 items about additional skills and attitudes required for geriatricians in domain III and finally 7 items on assessment and quality of postgraduate education in domain IV

Expert Panel

32 expert panel members from 30 different countries were invited to participate. All expert panel members and the facilitators are listed as authors of this publication. At the start of the Delphi process, each of them were either delegates of UEMS-GMS, members of the Special Interest Group (SIG) in Education and Training of the EUGMS or the Full Board of EUGMS or professors in EAMA. Belgium had responded that there might be a mismatch between curricula in the Flemish and French speaking part of the country. Therefore, it was decided to invite delegates from both parts of the country to participate. Furthermore, the United Kingdom, due to its pioneering position developing a national curriculum, was initially invited to bring in expertise from different parties. All panel members, except one, were trained geriatricians and were actively involved in medical care of older patients or teaching or training of young geriatricians. 23 panel members and four of the members of the core study group were also involved in academic work in Geriatric Medicine in terms of clinical science or teaching.

Delphi Rounds

Figure 1 gives an overview of how the Delphi process was conducted and how the curriculum was developed.

First Delphi Round

Panel members received an email asking for their willingness to participate in the process. For those responding with a positive answer the participants received another email including an initial version of the template shown in table 1 in the appendix of this publication. It was sent as an internet-based questionnaire to the panel in March 2016. They were asked to rate in a dichotomous fashion, with either “yes” or “no” answers. Additionally, they had the option to add free comments.

Responses were counted, and the feedback from the panel was evaluated. Items with <50% acceptance were excluded from the template or re-evaluated. Items with an acceptance rate between 50-70% and additional comments and suggestions were evaluated, condensed and integrated in the domains by the facilitators. The following guiding principles were taken into account during this process: a.) Improve the wording and language b.) Requests for adding a new item or aspect c) Requests for deleting an item or aspect of it and d) Requests for merging different items or aspects. The expert group ensured that any modification did not result in the omission of an objective that was considered relevant by the majority of the Delphi panel.

Second Delphi Round

Panel members were sent an e-mail with the invitation to the second Delphi round May 2017. For information, they received an interval update of the first Delphi round enclosed within this email. They received 45 items in total that were re-elaborated by the facilitators according to the guideline principles as outlined. The same procedure of rating and analysis was used as in the first Delphi round.

Third Delphi Round

During this round, panel members were informed that the expert group had attempted to produce a version which might be acceptable for all panel members, apart from two single items. In January 2018, panel members received an email including all agreed items and including the rate of acceptance for each single item. Panel members were asked for a vote on two remaining items which had not reached significant consensus after the second Delphi round. During the last round they were asked to rate in only dichotomous fashion with “yes” or “no” for those two items to remain in the final version of the curriculum.

RESULTS

Participation of expert panel members

The whole Delphi process took 3 years and included 3 major milestones until experts across Europe reached a consensus on the structure and content of the European recommendations on postgraduate training. 32 expert panel members from 30 different countries were invited to participate and responded. For the second Delphi round, again 32 panel members were invited but only 31 responded. For the third Delphi round 29 responded. Table 2 gives a summary overview of changes made by the panel at various stages of the Delphi process.

First Delphi Round

During the first Delphi round 9/12 items in domain I, 46/59 items in domain II, 8/11 items in domain III and 6/7 items in domain IV reached the level of significant positive feedback of more than 70% “yes” ratings of panel members. Due to additional comments from panel members the following decisions were initially taken by the core study group between March and April 2017: For domain I, 2 items were deleted and 5 items were merged into one common learning objective. In domain II, 13 items did not reach the level of significance and were therefore deleted. Additionally, 19 items of domain II were rephrased and 10 items were added due to panel members’ recommendation. 1 item was removed from Domain II and included in Domain III. Furthermore, 10 items were merged to 5 items and 14 items were incorporated into other items of domain II resulting in the deletion of a total of 26 items following the first Delphi round (see figure 1). In domain III, 3 items did not reach the level of significance and were deleted. Four items were rephrased according to panel members’ suggestions and one item was additionally included from Domain II, leaving 9 items as a final result. In domain IV, 6 items were incorporated into one item which was then rephrased into one overall item. Domain I and IV reached final positive overall feedback from panel members following the first Delphi round.

Second Delphi Round

A template for ratings was sent out to panel members in May 2017. Due to work done in between the two Delphi rounds by the core study group, the second Delphi round contained only 36 items in domain II for re-rating and 9 items in domain III. All items reached the level of significance. However, two of the items were sent back with major comments for rephrasing and merging respectively. These items were “Tissue Viability” and “Health inequalities”. The study facilitators decided to send these two items with additional wording, “Tissue Viability including pressure ulcers” and “Social and Health inequalities”, into another Delphi round to achieve full consensus. However, to accelerate the process and due to the type of comments made, the group decided to ask just for dichotomous answers.

Third Delphi Round

For the third Delphi round all 32 panel members were contacted by email January 2018. A positive reply to keep both items as suggested during the second Delphi round was achieved within three days. Four panel members did not answer despite one reminding email. Consensus of > 70% had been achieved according to guiding principles of the modified Delphi survey used in this project. Therefore, the core study group decided to close the process and outline the final, concerted recommendation of postgraduate curriculum in geriatric medicine across Europe. The final results are shown in table 3.

As may be seen from the table 3 the agreed recommendations currently contain four domains of learning objectives. One domain covers general considerations including six items from year of publication up to quality control. Domain II and III cover knowledge and skills to be achieved during postgraduate training, including 36 items and 9 items respectively. The last domain includes assessment methods and is addressing national exams at this stage of the process. All 7 items of domain IV reached the level of significance (83%), yet feedback from the experts showed that there was considerable divergence about the fine detail of conducting the process. It was therefore agreed by the panel that it was that it was appropriate to merge the initial 7 items of domain IV into one summarizing item to allow enough flexibility for individual countries to tailor their assessment processes to their individual circumstances.

DISCUSSION

Since 2015 the UEMS-GMS, EAMA and the EuGMS have continued their collaboration on curricular development following the successful development of European recommendations for undergraduate training in Geriatric Medicine [5]. These recommendations had been translated into several languages of EU member states following their first publication and had been successfully implemented in many European universities and faculties [8,9]. Following this process it was clear that the involvement of a broad group including expert clinicians and academics in the field of geriatric medicine is important to ensure the high quality content of the new postgraduate curriculum. To facilitate transnational implementation it was decided by the core study group to keep utmost transparency during the process and to consider only core components of a curriculum to be developed jointly across Europe [10]. Consequently several experts from all countries of the EU became involved. A modified Delphi technique was adopted as the method of choice to develop the content, leaving space for comments and suggestions to a panel affiliated to the three bodies and participating as panel members during the process [6,7]..

Due to wide variation in curricula across Europe, it was not thought possible to extrapolate common core components to be used as a starting template for the Delphi process. Consequently the group decided to use the previously validated audit instrument [4] itself to start. The Template (table 1) incorporated four domains covering important aspects of curricula addressing content on knowledge and skills and touches upon assessment methods recommended to assess training progress in postgraduate Geriatric Medicine training [4]. This basic structure was not challenged and remained unchanged during the three step process leading to the final curricular recommendations. This is not surprising as the development of the audit tool had also been developed using an open consultation method. Despite panel members (coming from all European countries) differing in the two processes, there seemed to be broad consensus between the two panels concerning the structure of a commonly agreed pan- European postgraduate curriculum. This strong internal consistency for the chosen structure among a large consortium of experts across Europe is one of the big strengths of this work.

The process to develop the recommendations presented in this publication needed a three step approach and lasted two years (see figure 1). Major drawbacks were delays in feedbacks from panel members and the logistics behind every Delphi round. The core study group had decided on cut offs for items to be accepted or deleted, improve wording, adding a new item or merging different items or aspects before starting the process. However, during evaluation in between Delphi rounds it became clear, that the

taxonomy chosen to pull together information was not able to cover all aspects of feedbacks given by the panel members. Some gave feedbacks to withdraw items and at the same time offered options to rephrase items. Other feedback not foreseen was to merge two items and rephrase simultaneously. The facilitator group decided to follow the rules of “majority” as discussed in the literature [6,7] and collated all feedback in relation to specific items such that if two actions were offered simultaneously by a panel member, the one also addressed by a majority of other members (> 70%, see methods section of this publication) was applied. This methodology is also described elsewhere [11]. Starting the process with semi-open formats offers the opportunity of gaining information which may not be collected in methodologies restricted to pure quantitative feedbacks from panel members. Although the template did not initially capture all permutations of feedback it was possible to discuss such feedback in relation to the various sections of the curriculum and we are confident that we captured and considered all opinions and suggestions. Using this approach, it was possible for the process described to leave space for a broad variety of inputs from all across Europe.

The finally agreed content of the new postgraduate recommendations in postgraduate education outlined in table 2 shows some changes when compared to the minimum training requirements previously published by UEMS-GMS [12]. Most of the competencies outlined in the UEMS curriculum are based on knowledge required to create an understanding of processes in geriatric care without taking consideration of current different models of Geriatric Medicine practice in Europe. There is emerging consensus for the need to work towards the harmonisation of post graduate training in Europe. This can be achieved by the establishment of pan-European education and training standards in the specialty [13]. Competencies are structured and practiced according to care settings and are not just dependent on levels of knowledge. The new curriculum outlined in this publication reflects the input and structure already present in some national curricula, such as the one from UK, France and others and is a continuation of the work performed in preparation of this final Delphi procedure to develop a pan-European curriculum [3]. Interestingly we found strong and straight forward consensus on knowledge and skills to be acquired for trainees during residency.

In the United States colleagues have very recently chosen to express the role of geriatricians using entrusted professional activities (EPA) adapted to care settings [14]. These indicate the capability to perform distinct tasks. However, such an approach strongly depends on care settings and health care demands aligned with national health care systems [15]. It may be argued that EPAs nowadays better describe the competencies required to practice a profession. However, given the huge variations in the role of Geriatric Medicine in EU member states, due to differences in health care systems detected during the preparatory phase of this project, it was thought not feasible to use EPAs to describe postgraduate training requirements in Geriatric Medicine across Europe at this stage.

One of the major strengths of the work presented is the support and endorsement from three bodies, UEMS-GMS, EuGMS and EAMA. Experts from all three societies supported the work during the entire process and none of the invited expert panel members left the consortium within the two years. As the template of the Delphi method described in this publication had also been built in an open consultation process by different experts we are confident that the work presented here reflects the broad European expert opinion on how to train and what to teach to young residents in geriatric medicine. Another advantage of the curriculum presented in this paper is that it leaves space for nations to develop national curricula according to local requirements and health care systems. This is in alignment with recommendations coming from the World Health Organization, addressing training requirements in the light of ageing societies [16]. Development of health care workforce is key to adapt health care systems to the needs of users in health systems [17]. EU wide actions and initiatives are currently addressing these needs. The development of this new curriculum will put geriatric medicine in the forefront of postgraduate medical education. Furthermore, the competencies will strengthen the leading position of Geriatric Medicine in the context of multi-professional care of older people [17].

In this context this curriculum should enable stakeholders within the Union to argue for development of training standards in Geriatric Medicine. There is a strong need for the speciality due to demographic changes and care requirements in the context of growing multi-morbidity and functional changes with increasing patient age. Currently more than 70% of the EU member states already commit to Geriatric Medicine as a specialty. The new curriculum establishes European training standards and will also facilitate transnational migration of geriatricians within EU borders.

Limitation of the work is the timely length of the process as a whole. The results presented in this paper are based upon core content collected three years ago from member states. It is to be expected that some member states have changed their postgraduate curricula in the meantime. Due to this fact there is a strong need to continue research work in the field. Ongoing work is required to collect all curricula from member states and to compare the current contents with the new recommendations.

Another issue arising from this work is the question of whether a Pan-European common assessment in geriatric medicine is required [19,20,21]. Looking at table 3 it becomes clear that panel members are recommending an assessment. However, it was not possible to align them towards a more detailed outline for a common examination structure. As assessment drives learning, the format of an assessment strongly influences training requirements and settings. It may be speculated that, due to the wide variation between EU member states it will be difficult to establish a common consensus on this issue. This point needs to be addressed in more detail in the near future and will be the focus for discussion in the UEMS-GMS and EuGMS organisations in the next few years.

Contribution from Authors: Regina Roller-Wirnsberger and Katrin Singler were in charge of the scientific support of the project including all preparatory work published elsewhere. Martina Zöbl supported the project in terms of administrative work and helped to prepare the draft manuscript. The three persons named also formed the core group evaluating data from the feedbacks during the Delphi rounds together with Tahir Masud and Michael Vassallo. All other authors listed gave feedback during the process and read and approved the manuscript in its current version.

Conflict of Interest: The project was supported by EUGMS by a restricted grant in 2017, which was used to support the administrative work during the Delphi procedure.

References

1. Charter on Training of Medical Specialists in the European Community. Charter adopted by the Management Council of the UEMS.1993 UEMS
2. Kern, D. E., P. A. Thomas, M. T. Hughes and B. Y. Chen. Curriculum Development for Medical Education: A Six-Step Approach. 2015 Springer Publishing Company
3. Singler, K., E. A. Holm, T. Jackson, G. Robertson, E. Muller-Eggenberger and R. E. Roller. European postgraduate training in geriatric medicine: data of a systematic international survey. *Aging Clin Exp Res* 2015; **27**(5):741-750.
4. Singler K., Gordon AL, Robertson G, Roller RE. The development of a geriatric postgraduate education assessment instrument using a modified Delphi procedure." *Age Ageing* 2016;45(5):718-722.

5. Masud T, Blundell A, Gordon AL, Mulpeter K, Roller R, Singler K, Goeldlin A, Stuck A. European undergraduate curriculum in geriatric medicine developed using an international modified Delphi technique. *Age Ageing* 2014;**43**(5):695-702.
6. Adler M. and Ziglio E . *Gazing Into the Oracle: The Delphi Method and Its Application to Social Policy and Public Health*, 1996 Jessica Kingsley Publishers.
7. Vernon, W. The Delphi technique: A review." *International Journal of Therapy and Rehabilitation* 2009;**16**(2):69-76
8. Singler K, Stuck AE, Masud T, Goeldlin A, Roller RE. Lernzielkatalog für die studentische Lehre im Fachbereich, Geriatrie“ an Fakultäten für Humanmedizin." *Zeitschrift für Gerontologie und Geriatrie* 2014;**47**(7):570-576.
9. Vilches-Moraga A, Ariño-Blasco S, Verdejo-Bravo C, Mateos-Nozal J. Plan de estudios universitarios en medicina geriátrica desarrollado utilizando una técnica internacional Delphi modificada. *Revista Española de Geriatria y Gerontología* 2015; 50(2): 82-88.
10. Laurie R Nonoyama-Tarumi Y, McKeown R, Hopkins C. Contributions of Education for Sustainable Development (ESD) to Quality Education: A Synthesis of Research. *Journal of Education for Sustainable Development* 2016; **10**(2): 226-242
11. Brady SR. Utilizing and Adapting the Delphi Method for Use in Qualitative Research. *International Journal of Qualitative Methods* 2015;**14**(5): 1609406915621381.
12. Training in Geriatric Medicine in the EU. Training Requirement 2016. [uemsgeriatricmedicine.org/www/dok/Minimum Training Requirement 2016.pdf](http://uemsgeriatricmedicine.org/www/dok/Minimum%20Training%20Requirement%202016.pdf) accessed 4th August 2018
13. Fisher JM, Masud T, Holm EA, Roller-Wirnsberger RE, Stuck AE, Gordon A, Blain H, Knight P, Frühwald T, Petermans, Nuotio MS, Ihle-Hansen HB, Blundell A, Bakó G, Burns E, Davidovic MM, Jónsdóttir AB, Kolk H, Krulder JWM, Lambert M, Maggi S, Martinez-Velilla N, Pinter GF, Singler K, Thompson S, Van Den Noortgate NJ, Vassallo MA ,Veninšek G. New horizons in geriatric medicine education and training: The need for pan-European education and training standards." *European Geriatric Medicine* 2017; 8(5): 467-473.
14. Leipzig R. Sauvigne MK, Granville LJ, Harper GM, Kirk LM, Levine SA, Mosqueda L, Parks SM, Fernandez HM , Busby-Whitehead J. What is a geriatrician? American Geriatrics Society and Association of Directors of Geriatric Academic Programs end-of-training entrustable professional activities for geriatric medicine. *J Am Geriatr Soc* 2014; **62**(5): 924-929.
15. ten Cate O, Scheele F. Competency-based postgraduate training: can we bridge the gap between theory and clinical practice? *Acad Med* 2007;**82**(6):542-547.
16. WHO, IFMSA Teaching Geriatrics in Medical Education II, Department of Ageing and Life Course and IFMSA.2018 http://www.who.int/ageing/publications/geriatrics_survey/en/ Accessed 24th August 2018.
17. Windhaber T, Koula ML, Ntzani E, Velivasi A, Rizos E, Doumas MT, Pappas EE, Onder G, Vetrano DL, Roudriguez Laso A, Roudriguez Manjas L, Illario M, Roller-Wirnsberger RE. Educational strategies to train health care professionals across the education continuum on the process of frailty

- prevention and frailty management: a systematic review. *Aging Clin Exp Res* 2018 Feb 23. doi: 10.1007/s40520-018-0918-9.
18. Kidd E. Promoting a sustainable workforce for health in Europe. *Eurohealth*. Vol **15** (1): 20-22.
 19. Windhaber T, Koula ML, Ntzani E, Velivasi A, Rizos E, Doumas MT, Pappas EE, Onder G, Vetrano DL, Roudriguez Laso A, Roudriguez Manjas L, Illario M, Roller-Wirnsberger RE. Educational strategies to train health care professionals across the education continuum on the process of frailty prevention and frailty management: a systematic review. *Aging Clin Exp Res* 2018. <https://doi.org/10.1007/s40520-018-0918-9>
 20. Michel JP, Huber P, Cruz-Jentoft AJ. Europe-Wide Survey of Teaching in Geriatric Medicine. *J Am Ger Soc* 2008;**56**(8):1536-1542.
 21. Roller RE, Petermans J. Education and training in geriatrics in the 21st century - where do we come from - where do we go? *European Geriatric Medicine* 2015 **6**(3): 205-207.
 22. Miller GE. The assessment of clinical skills/competence/performance. *Acad Med* 1990; **65**(9 Suppl): S63-67

Tables

Table 1 (Appendix): Template used to start the Delphi process

<i>Please rate the following items either to be included or not in the new European recommendations for postgraduate training in geriatric medicine</i>		Yes	No	<i>Suggestions for changes in wording</i>
Domain I: General considerations				
1	Year of publication or latest update of syllabus/curriculum cited			
2	Bibliography added			
3	Editors of the syllabus/curriculum cited			
4	Institutions/societies responsible for content cited			
5	Aim of syllabus/curriculum outlined			

6	Institution/society/ministry responsible for quality control cited			
7	Role and responsibilities of program director/educator within the training institutions described			
8	Accreditation process for training institutions described			
9	Minimum structural requirements for institutions involved in training of young geriatricians described (space, acute care hospital, long-term care facility, long term non-institutional care services, ambulatory care facilities, other support services)			
10	Disciplines and other health care professions involved in post graduate training described			
11	Resources required described (equipment, medical records, patient population, medical information access)			
12	Tutor : Trainee ratio described			
<i>Please rate the following items whether to be included or not in the new European recommendations for postgraduate training in geriatric medicine</i>		Yes	No	<i>Suggestions for changes in wording</i>
Domain II: Knowledge in patient care				
1	The current scientific knowledge of ageing			
2	The current scientific knowledge of longevity			
3	Cultural, ethnic, gender and demographic aspects of ageing			
4	Age related diseases (eg heart failure in the elderly, syncope etc), their clinical presentations and their effect on functionality			
5	Geriatric syndromes in general (e.g. falls, movement disorders, malnutrition, dementia, delirium etc.): their clinical presentations and their effect on functionality			
6	Impact of age- related diseases on organ function in the context of multi-morbidity			
7	Ageism			
8	Personalized medical approach on an individual level			
9	Tailored medical approach for identified geriatric populations on a public—health level			
10	Psychosocial aspects of ageing			
11	Aspects of preventive medicine			
12	Pharmacologic problems associated with ageing			
13	Iatrogenic disorders and their prevention			
14	General principles of geriatric rehabilitation			
15	The pivotal role of the family in caring for the elderly			
16	Community resources (formal support systems) required to support both the patient and the family			

17	Issues arising in the context of home care			
18	Management of patients in long-term care			
19	Issues arising in the context of palliative/hospice care			
20	Economic and financial aspects related to ageing			
21	Ethical aspects in the management of older people			
22	Role of the interdisciplinary team			
23	All content on geriatric assessment			
24	Frailty and its role in the management of older people			
25	Interdisciplinary approach in the management of geriatric patients (eg. orthogeriatrics)			
26	Age-related changes in organs, tissue, cells and their impact on organ diseases			
27	Interrelation between Nutrition and Aging			
28	Emergency care of older people			
29	Demographic changes and their impact on health care systems			
30	Aspects of gerontechnology			
31	Interventions to support an autonomous life			
32	Sexuality and sexual disorders in the elderly			
33	Addiction and dependence in the elderly			
34	Aspects of elder abuse			
35	Coping with disease			
36	Architectural aspects of age appropriate housing and ambient assisted living			
37	Therapeutic concepts in advanced age of other health care professions involved in the care of elderly (physical and occupational therapy, speech therapy, nutritional therapy, psychological support and nursing)			
38	Aspects of advocacy			
39	Legal aspects for older people (patient rights, law to protect incompetent patients, law on euthanasia, driving licence...)			
40	Explicit geriatric syndromes (dysphagia, sarcopenia, chronic pain, sleep disorders, incontinence, pressure ulcers, ...)			
41	Planning transfers of care (ie from hospital to new care home)			
42	Health inequalities			
43	Legal framework of practice			
44	Perioperative medicine			
45	Psychiatric disorder of old age others than delirium and dementia affecting mood			

46	Stroke			
47	Falls			
48	Syncope			
49	Orthogeriatrics and bone health			
50	Continence			
51	Community practice			
52	Parkinson syndroms			
53	Dizziness			
54	Vertigo			
55	Depression			
56	Movement disorders			
57	Malnutrition			
58	Dementia			
59	Delirium			
<i>Please rate the following items whether to be included or not in the new European recommendations for postgraduate training in geriatric medicine</i>		Yes	No	<i>Suggestions for changes in wording</i>
Domain III: Additional skills and attitudes required for geriatricians				
1	Basic and clinical research for academic settings			
2	Educational skills			
3	Interpersonal and communication skills			
4	Development of geriatric services/administrative duties			
5	Quality control			
6	Interdisciplinary team management			
7	Advocacy of patients' requirements and wishes			
8	Leadership competencies			
9	Management skills			
10	Life-long learning			
11	Multidisciplinary leadership skills			
<i>Please rate the following items whether to be included or not in the new European recommendations for postgraduate training in geriatric medicine</i>		Yes	No	<i>Suggestions for changes in wording</i>
Domain IV: Assessment of postgraduate education which items are important for the transnational comparison process				

1	Schedule of assessments described			
2	Competence-based assessment described			
3	Type of assessment((formative or summative) described			
4	Faculty evaluation described			
5	Programme evaluation described			
6	Kind of graduation (subspecialty, specialty) described			
7	Quality assesement described			

Table 1: Table 1 shows the primary template sent out to panel members for the development of the postgraduate curriculum in geriatric medicine. The template had been built on core elements elaborated from 30 national curricula published in Age & Ageing 2016 [4] [Singler et al. 2016], which were than clustered into 4 domains in accordance with content of the latest recommendations published by the UEMS-GMS (2). As may be seen from the table general considerations, knowledge in patient care, skills and attitude required for geriatricians in Europe as well as considerations on assessment methods necessary for further transnational comparison of educational level of geriatricians were outlined in this primary version of the Pan- European Curriculum.

Table 2. Summary of the sequence of Delphi Process highlighting changes done to curriculum before the final version was reached

Delphi Round 1							Delphi Round 2				Delphi Round 3				END
Domain	No. of Items	action					Domain	No. of Items	action		Domain	action	Final Version	Number of Items	Final Version all 4 domains send out to all experts
I	12 Items		2 items deleted		5 items merged into 1 item	3 items rephrased	I	not send out			I	not send out	Domain I	6 Items	
II	59 Items	10 new items to list geriatric syndromes separately	26 items deleted	1 item moved into Domain 3	12 items merged into 6 items	19 items rephrased	II	36 Items	9 items rephrased	2 items remain unclear ...	II	2 unclear items send out again and reach agreement	Domain II	36 Items	
III	11 Items	1 additional item from Domain 2	3 items deleted			4 items rephrased	III	9 Items			III	not send out	Domain III	9 Items	
IV	7 Items		5 items deleted		2 items merged into 1 item		IV	not send out			IV	not send out	Domain IV	1 Item	

Table 3: Recommendations for training requirements to become a geriatrician in Europe including level of agreement

Domain I: General considerations		% of agreement
1	Year of publication or latest update of syllabus/curriculum cited	94
2	Recommended reading	78
3	Editors of the syllabus/curriculum cited (Roller-Wirnsberger, Singler, Masud, Vassallo) plus national contact point	78
4	Institutions/societies responsible for content cited (UEMS, EUGMS, IAGG-ER, EAMA)	94
5	Aim of syllabus/curriculum outlined (text provided by Katrin Singler)	88
6	Quality control: institution/society/ministry, role and responsibilities of program director/educator within the training institutions, accreditation process for training institutions, minimum structural requirements for institutions involved in training of young geriatricians (space, acute care hospital, long-term care facility, long term non-institutional care services, ambulatory care facilities, other support services), disciplines and other health care professions involved in post graduate training	78
Domain II: Knowledge in patient care		% of agreement
1	Biology of ageing	97
2	Acute and Chronic Disease in Old Age, their clinical presentation including atypical presentation and their effect on organ function and functionality	100
3	Falls	100
4	Dizziness and Vertigo	87
5	Syncope	87
6	Gait disorders	87
7	Parkinson's Disease and Syndromes	97
8	Other Movement disorders	87
9	Stroke	93
10	Dysphagia	97
11	Malnutrition and fluid imbalance	100
12	Osteoporosis and bone health	97

13	Sarcopenia	97
14	Frailty	97
15	Continence (urinary and faecal)	100
16	Pain (acute and chronic)	100
17	Dementia and cognitive impairment	100
18	Delirium	100
19	Sleep disorders	90
20	Depression	97
21	Other psychiatric disorders in old age	87
22	Tissue Viability including pressure ulcers	70
23	Ethical issues including ageism and elder abuse	100
24	Legal aspects for older people (country specific)	93
25	Social and Health inequalities	70
26	Health promotion and healthy ageing <i>(Please not here that the learning objective includes here the following aspects: physical activity, keeping active, avoiding smoking and excessive alcohol, life-style interventions, vaccination, Vit. D, loneliness, nutritional aspects)</i>	100
27	Pharmacological issues associated with ageing and in geriatric care	100
28	Iatrogenic and care delivered disorders	87
29	Sexuality in older adults	93
30	Comprehensive Geriatric assessment	100
31	Content and principles of geriatric rehabilitation and its multi-professional aspects	97
32	Multidisciplinary and interdisciplinary approach in the management of geriatric patients (eg. orthogeriatrics, oncogeriatrics, perioperative care, cardiology, nephrology, emergency medicine and others)	100
33	Role of family and other care givers	97
34	Management of patients in long-term care including residential and nursing care homes	93
35	Palliative and Hospice Care in older patients	97
36	Gerotechnology and eHealth – appropriate housing, ambient assisted living, interventions to support an autonomous life	100

Domain III: Additional skills and attitudes required for geriatricians		% of agreement
1	Educational and teaching skills	90
2	Interpersonal and communication skills	97
3	Development of geriatric services (country specific)	83
4	Quality improvement competencies	87
5	Interprofessional team management	100
6	Advocacy of patients' requirements and wishes	83
7	Leadership competencies	80
8	Life-long learning and continuous professional development	83
9	Integration of holistic skills and attitudes for an individualized person-centred care	83
Domain IV: Assessment of postgraduate education: which items are important for the transnational comparison process		% of agreement
1	National medical specialist exam (format and timing)	83

Table 3: Table 3 shows the final consensus achieved among experts on core components to be addressed to become a geriatrician in Europe. This consensus will be the core to further identify competence levels for single items on knowledge, skills and attitudes on a national level for countries adopting the recommendation launched by UEMS-GMS, EuGMS and EAMA.

Figures

Figure 1: Process of the development of the Curriculum for postgraduate training of Geriatricians in Europe

