

## RESEARCH PAPER

# Updating the British Geriatrics Society recommended undergraduate curriculum in geriatric medicine: a curriculum mapping and nominal group technique study

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## Abstract

**Background:** medical education must adapt to meet the challenges and demands of an ageing population, ensuring that graduates are equipped to look after older patients with complex health and social care needs. Recommended curricula in geriatric medicine in the United Kingdom and Europe offer guidance for optimal undergraduate education in ageing. The UK version, written by the British Geriatrics Society (BGS), requires updating to take account of innovations in the specialty, changing guidance from the General Medical Council (GMC), and the need to support medical schools preparing for the introduction of the national Medical Licensing Assessment (MLA).

**Methods:** the BGS recommended curriculum was mapped to the most recent European curriculum (2014) and the MLA content map, to compare and contrast between current recommendations and nationally mandated guidance. These maps were used to guide discussion through a virtual Nominal Group Technique (NGT), including 21 expert stakeholders, to agree consensus on the updated BGS curriculum.

**Results:** the curriculum has been re-structured into seven sections, each with 1–2 overarching learning outcomes (LOs) that are expanded in multiple sub-LOs. Crucially, the curriculum now reflects the updated GMC/MLA requirements, having incorporated items flagged as missing in the mapping stages.

**Conclusion:** the combined mapping exercise and NGT have enabled appropriate alignment and benchmarking of the UK national curriculum. These recommendations will help to standardise and enhance teaching and learning around the care of older persons with complexity.

**Keywords:** curriculum, undergraduate, medical education, geriatric medicine, ageing, older people

## Key Points

- The ageing population requires that doctors are equipped to provide high quality care for older people with complex needs.
- To capture advances in geriatrics, and align with new national requirements, it was pertinent to update the British Geriatrics Society recommended undergraduate curriculum.

- We used a multi-stage process of mapping and nominal group technique with key stakeholders to derive consensus on this update.
  - This comprehensive curriculum update provides a vital benchmark for medical schools preparing students for professional practice.
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## Introduction

The global population over 65 years of age is expected to increase by 120% between 2019 and 2050, yet 27% of the world's medical schools do not teach geriatric medicine [1, 2]. The World Health Organisation (WHO) advocate for national guidelines as a means of increasing and improving educational provision in geriatric medicine [3]. Consequently, there exist several national and international undergraduate curricula written by expert consensus, delineating minimum requirements for medical graduates in the care of older adults [4]. These aim to standardise teaching and assessment in geriatric medicine, thus ensuring that newly qualified doctors are well-equipped to care for older patients with complex health and social care needs.

In their international study on 'Teaching Geriatrics in Medical Education', the WHO found that the quality of education in ageing at medical school positively influenced students' attitudes towards older people, which in turn made them more likely to consider a career as a geriatrician [2]. Yet, in their same study, the WHO found that 15.8% of UK medical students were receiving no teaching in geriatric medicine [2]. Subsequent work by the British Geriatrics Society (BGS) has found that UK medical schools only dedicate, on average, 49–56 hours of teaching to ageing and geriatrics [5, 6]—an insufficient proportion of a 4–6 year degree devoted to the most rapidly expanding patient group [7]. Further work has identified more specific deficiencies in educational provision on dementia and frailty [8, 9]. The BGS proposed four ways to improve this, the first of which was a national curriculum [10, 11]. The BGS recommended undergraduate curriculum in ageing and geriatric medicine was first written based on expert consensus in 2008, and subsequently updated in 2013 based upon reviews of national guidance [12]. With the majority of this work having been published a decade ago, it is timely and necessary that undergraduate education in geriatric medicine is underpinned with up-to-date research and guidance.

Alongside evolving demographic trends, there have been significant advances in the field of geriatric medicine in the intervening decade, for instance the widespread understanding, acceptance and adoption of frailty syndromes and the evolution of evidence bases for new models of care and subspecialties, including, but not limited to, acute frailty units, pre- and peri-operative geriatric medicine and hospital at home [13–16]. It is, of course, apposite that these changes be reflected in national curricula [9]. At the same time, the United Kingdom General Medical Council (GMC) has updated its curriculum requirements for new graduates, and has announced the introduction of a nationally standardised

Medical Licensing Assessment (MLA) in 2024, which all UK medical students will need to pass to join the medical register [17–19]. All these reasons meant that the previous curriculum required updating.

Our aim was to identify important emergent learning outcomes (LOs) and then establish expert consensus around core outcomes for inclusion in the updated BGS recommended undergraduate curriculum using a two-stage process. First we mapped the previously published BGS curriculum to the GMC's MLA content map, since this is the standard to which new graduates will be held, and also to the European undergraduate curriculum in geriatric medicine, since this represented a more up-to-date pan-European specialist consensus [19, 20]. Secondly, we conducted a virtual Nominal Group Technique (vNGT) with key stakeholders.

## Methods

### Mapping exercises

The current BGS recommended curriculum was mapped to the European curriculum and MLA content map to identify gaps and inform the update process. The mapping exercise comprised multiple stages: firstly, the most up-to-date versions of each curriculum were identified and inputted into a data collection form. Three reviewers independently identified and compared the LOs from the BGS with the European curriculum and the MLA content map [19, 20], and met to identify and discuss LOs that were partially overlapping or present in one curriculum and absent in the others. Furthermore, general observations and comments about the curricula and mapping were noted. These maps were used to produce a blueprint for the update, which was circulated to the BGS curriculum nominal group prior to meeting.

### Virtual nominal group technique

Nominal group technique (NGT) is an established consensus method for writing and updating guidance [21]. NGT was chosen due to its open and discursive nature, with a framework that aims to minimise social hierarchy by enabling periods of individual reflection and structuring responses so that all participants are given an equal opportunity to contribute. In the context of the COVID-19 pandemic, we opted to use an adapted virtual NGT (vNGT), meeting over videoconferencing software [22]. vNGT has five stages, outlined in Table 1.

Group participants were chosen to ensure a broad coverage of clinical expertise from geriatric medicine and

**Table 1.** Detailed outline of the vNGT process.

Section	Purpose
Introduction	Presentations by the primary research team outline the background, purpose and structure of the vNGT. The Chair invites all participants to introduce themselves in turn.
Silent idea generation	Participants turn off their microphone and video functions. They are given 15 minutes to consider what LOs they think should be in an undergraduate curriculum in geriatric medicine.
Round robin	With microphone and video functions re-enabled, the Chair invites each participant in turn to offer a single LO, in order of perceived importance. Each participant is asked to only contribute new ideas, so if their highest ranked LO has already been listed then they should move onto their next one. This process continues as a cycle until everyone's ideas are exhausted. The LOs are typed into a live document, visible in real-time to all participants via screen-share.
Clarifications	One by one, the LOs written in the live document will be addressed, to clarify any areas of ambiguity and overlap. LOs are combined or expanded by mutual agreement. This process continues until all uncertainties have been resolved.
Voting	If there is any unresolved disagreement about the order, wording or inclusion of LOs, these are put to a vote after the vNGT is finished.

**Table 2.** Clustered European LOs missing from the BGS curriculum.

Displayed are the sub-LOs in the European curriculum that are missing from the BGS curriculum, which we found were clustered within European sections 4 and 6. Readers should note that not all the sub-LOs for sections 4 and 6 are listed, only those that were found to be missing from the UK curriculum.

Section LO	Sub-LOs
4: Graduates should have the special skills needed to conduct a history and perform an assessment in an older patient	Graduates should be able to: <ul style="list-style-type: none"> <li>• Obtain a history from an older patient, including from a proxy person</li> <li>• Perform a geriatric assessment using a standardised approach of: Basic and instrumental activities of daily living, cognition, gait and balance, hearing, mood, nutrition and vision</li> </ul>
6: Graduates should recognise the importance of responses to illness, providing help towards recovery and reducing or managing impairments, disabilities, and handicaps	Graduates should be able to: <ul style="list-style-type: none"> <li>• Define the concept of frailty in older people</li> <li>• Interpret findings of geriatric assessment, and suggest diagnostic, therapeutic and management steps as a result of abnormal findings</li> <li>• Recognise the role of social and environmental factors and life experience in caring for older patients</li> <li>• Recognise the role of aids (e.g. hearing aids, toileting aids, transfer aids, walking aids) in the management of older people with functional limitation</li> </ul>

gerontology (doctors, nurses, allied healthcare professionals and gerontologists) and geography (representatives from all four UK nations). Where lay advisors or patients are usually included in updating clinical guidance, we have instead included undergraduate medical students and medical school staff to provide an 'end-user' perspective on this curriculum. 21 people were invited, of which 15 attended the virtual meeting in March 2022. All invitees, regardless of attendance at the meeting, were invited to comment on the draft curriculum update.

## Results

### Mapping exercises and virtual nominal group technique

We have observed that the current BGS curriculum adopts a 'passive' approach to undergraduate clinical learning, whilst the European curriculum recommends a more 'active' role for medical students in the care of older patients

and within multidisciplinary teams. This is demonstrated by BGS LOs beginning with 'Students should be able to describe/define...', while the European curriculum uses active verbs, such as 'recognise', 'conduct', 'obtain', 'interpret' and 'perform'. We also noted that many of the European LOs missing from the BGS curriculum clustered in two sections: '4: Graduates should have the special skills needed to conduct a history and perform an assessment in an older patient' and '6: Graduates should recognise the importance of responses to illness, providing help towards recovery and reducing or managing impairments, disabilities, and handicaps' (Table 2), highlighting, once again, that the UK curriculum is currently highly conceptual and knowledge-based, missing guidance on practical and communication skills required for the care of older patients.

Table 3 highlights presentations and conditions categorised under 'Medicine for Older People' in the MLA content map, but which are currently missing from the BGS curriculum, the most notable of which was the whole topic of frailty [9]. Similarly, named conditions present

**Table 3.** MLA presentations and conditions categorised as ‘Medicine for Older People’.

The MLA content map comprises four sections: Areas of clinical practice, areas of professional knowledge, clinical and professional capabilities and practical skills and procedures. The areas of clinical practice are sub-divided into ‘presentations’ and ‘conditions’ and are categorised by specialty. MLA areas of clinical practice filtered to ‘Medicine for Older People’ yields 26 presentations and 13 conditions. Those marked in red were found to be missing from the current BGS curriculum on mapping. Those marked in brackets were deemed not relevant enough/too broad for inclusion in this curriculum update.

Presentations	Conditions
Abnormal involuntary movements	<b>Benign paroxysmal positional vertigo</b>
<b>Auditory hallucinations</b>	<b>Cardiac failure</b>
<b>Blackouts and faints</b>	Delirium
Confusion	Dementias
<b>Constipation</b>	<b>Lower limb fractures</b>
<b>Dizziness</b>	<b>Malnutrition</b>
<b>Driving advice</b>	Non-accidental injury
Elder abuse	Osteoporosis
<b>Electrolyte abnormalities</b>	Parkinson’s disease
Faecal incontinence	Pressure sores
Falls	Urinary incontinence
<b>Frailty</b>	(Hyperparathyroidism)
<b>Hearing loss</b>	(Squamous cell carcinoma)
<b>Hypertension</b>	
<b>Immobility</b>	
Memory loss	
Mental capacity concerns	
<b>Peripheral oedema and ankle swelling</b>	
Skin ulcers	
<b>Struggling to cope at home</b>	
Urinary incontinence	
<b>Urinary symptoms</b>	
<b>Vertigo</b>	
<b>Visual hallucinations</b>	
(Chest pain)	
(Trauma)	

in the European curriculum but absent from the BGS curriculum are shown in [Table 4](#). These were incorporated, predominantly into section 3 of the updated curriculum (specific age-related conditions, [Table 5](#)).

**Virtual nominal group technique**

Due to key gaps and differences highlighted in the mapping phase ([Table 2](#)), the vNGT agreed to create a new section in the BGS curriculum titled ‘Clinical care of older people’ ([Table 5](#)), promoting active participation of students in teams caring for older people. Moreover, new LOs now incorporate communication skills and end-of-life care.

Section 3 ‘Specific age-related conditions’ proved the most divisive in NGT discussions, which mirrors similar controversy in the European Delphi process [20]. A long list of specific conditions was generated in the ideas phase of vNGT, however during clarifications many argued that

**Table 4.** Medical conditions specifically named in the current BGS and European curricula.

Presented are the sections/LOs in which specific medical conditions are named in the UK and European curricula. Those highlighted in red were found to be missing from the BGS curriculum on comparison to the European curriculum.

BGS	European
<p><i>LO3f:</i> Students should be able to describe the diagnosis, pathophysiology, management and preventative strategies for specific disease processes</p> <ul style="list-style-type: none"> <li>• Dementia</li> <li>• Delirium</li> <li>• Depression</li> <li>• Continence</li> <li>• Osteoporosis</li> <li>• Falls</li> <li>• Parkinsonism and movement disorders</li> <li>• Pressure ulcers</li> <li>• Cerebrovascular disease and stroke</li> </ul>	<p><i>Section 3: Graduates should know about common medical conditions in older people.</i></p> <p>Graduates should be able to describe the pathophysiology, diagnosis, assessment, management, and preventative strategies for common geriatric syndromes in older people</p> <ul style="list-style-type: none"> <li>• <b>Chronic pain</b></li> <li>• Dementia and delirium</li> <li>• Elder abuse: physical, psychological, financial and sexual</li> <li>• Falls and movement disorders</li> <li>• <b>Hearing and vision disorders</b></li> <li>• <b>Malnutrition and sarcopenia</b></li> <li>• Pressure ulcers</li> <li>• Urinary and faecal incontinence</li> </ul> <p>Graduates should be able to describe relevant aspects of pathophysiology, diagnosis, management and preventative strategies for common problems in older people</p> <ul style="list-style-type: none"> <li>• <b>Cardiovascular disease (including heart failure and hypertension)</b></li> <li>• Cerebrovascular disease and stroke</li> <li>• <b>Chronic obstructive pulmonary disease and pneumonia</b></li> <li>• Depression</li> <li>• <b>Diabetes</b></li> <li>• <b>Disorders of fluid balance</b></li> <li>• Osteoporosis</li> <li>• <b>Renal failure</b></li> </ul>
<p><i>LO10:</i> Students should be aware of the issues of elder abuse (physical, psychological and financial)</p>	<p><i>Within Section 6:</i> Graduates should be able to define the concept of <b>frailty</b> in older people</p>

the curriculum needed to be concise to be user-friendly. The consensus was to remove broader concepts and conditions considered to fall under general internal medicine (GIM), replacing this with a general LO encompassing the practice of general medicine in older patients ([LO3b](#), [Table 5](#)). Additionally, the introductory statement to the curriculum recommends that LOs be covered longitudinally throughout medical school and integrated into other GIM attachments, not only in geriatric medicine rotations. The only exception to this is the inclusion of ‘Cardiovascular disease’ in [LO3a](#) ([Table 5](#)), as several cardiovascular presentations and conditions are specifically categorised under ‘Medicine for Older People’ in the MLA content map ([Table 3](#)).

**Table 5.** The updated BGS recommended undergraduate curriculum in geriatric medicine.

The updated curriculum has been re-structured in 7 sections, each with 1–2 overarching LOs (column 1), which are then expanded and clarified in several sub-LOs (column 2), modelling the structure of the European curriculum.

### Introductory Statement

Undergraduate teaching in geriatric medicine has a critical role to play in equipping doctors of the future with the knowledge, skills and expertise to care for older adults with complex needs. This curriculum is designed on the basis of the 2013 British Geriatrics Society recommended curriculum in geriatric medicine for medical undergraduates. The purpose of this update is to ensure that the recommendations meet the standards required of all clinicians practising in the UK set by the General Medical Council in Outcomes for Graduates and the Medical Licensing Assessment, and to bring UK guidance in-line with the European recommended undergraduate curriculum.

This new curriculum is based around seven core concepts of geriatric medicine and has been developed by a multidisciplinary team using a nominal group technique. These recommendations are for medical schools and medical students in the UK and are written to reflect the standard expected of a Foundation Year 1 doctor upon graduation from medical school. We recognise that many of these recommendations are applicable to other areas of clinical practice, and therefore encourage a longitudinal inter-weaving of these concepts throughout undergraduate teaching.

### Section 1—Foundations of ageing and geriatric medicine

*1a: Graduates should maintain a professional and respectful approach to patients, regardless of their age, by:*

- i. Demonstrating professional and respectful communication with patients, carers, next of kin, and healthcare professionals, recognising that conversations and the terminology used around ageing, frailty and dying need to be approached with consideration and sensitivity.
- ii. Recognising the issue of stereotypes related to older people and advocating against ageism, with an awareness of the negative effect that ageism can have on the care of older patients.
- iii. Recognising the heterogeneity of older people and ageing as a spectrum, and considering patients' ethnic, sexual, and cultural backgrounds.

*1b: Graduates should understand the natural history of human diseases, including disease presentation, progression, and responses to illness, by:*

- i. Explaining the biochemical, molecular, cellular, genetic and psychosocial theories of ageing.
- ii. Describing the anatomical, histological and physiological changes associated with ageing.
- iii. Describing the pathology associated with ageing, age-associated disease processes and dying.
- iv. Explaining the concepts of frailty, disability and multi-morbidity in older people.
- v. Recognising that older people with frailty often present with non-specific symptoms and atypical signs, which should be accounted for in diagnostic, investigative, therapeutic, and prognostic clinical reasoning, and understanding that this is likely to be associated with elements of clinical uncertainty.

### Section 2—Clinical care of older people

*2a: Graduates should have the special skills needed to care for older people comprehensively and compassionately by:*

- i. Taking a history from older patients, including gaining a collateral history where necessary.
- ii. Performing a physical assessment in an older person, that includes assessment of activities of daily living, cognition, gait and balance, hearing, mood, skin, vision, nutrition and hydration, and using objective assessment tools available in these domains where appropriate, after considering their indications and limitations.
- iii. Defining Comprehensive Geriatric Assessment (CGA) and listing its main domains: physical, functional, social, environmental and psychological.
- iv. Contributing towards the process of CGA, engaging with multidisciplinary team members in each of these steps: initial assessment, establishment of a problem list, management plan, goals and iteration.
- v. Interpreting the findings of CGA, suggesting diagnostic and management steps, and tailoring the investigations and management based on clinical need and the patient's priorities.
- vi. Applying the principles of evidence-based practice in their care of older people, accounting for multi-morbidity and recognising the limitations of existing research when extrapolating data from studies performed in younger people when applying generic guidelines.

*2b: Graduates should recognise the impact of illness on function, providing help towards recovery, reducing, or managing impairments and maintaining independence, by:*

- i. Describing the concepts of prehabilitation and rehabilitation, and their role in the continuum of health promotion.
- ii. Recognising the role of social and environmental factors in older persons' health, and considering an individual's life experience, values and preferences when making shared decisions about their care.
- iii. Recognising the role of aids (e.g. hearing aids, toileting aids, transfer aids, walking aids, assistive technologies) in the management of older people with cognitive, sensory and functional limitations, and potential barriers to their adoption.
- iv. Adapting their communication and assessment approach to suit individual patients with cognitive, sensory and/or functional impairments.
- v. Understanding and being prepared to discuss the impact of physical and cognitive limitations on a patient's ability to drive safely and be able to apply relevant governmental guidance to individual cases.

### Section 3—Specific age-related conditions

*3a: Graduates should be able to describe the pathophysiology, diagnosis, assessment, management and preventive strategies for common conditions and syndromes encountered within geriatric medicine:*

- i. Bladder and bowel disorders
- ii. Cardiovascular disease (including blood pressure instability, heart failure and syncope)
- iii. Cerebrovascular disease and stroke
- iv. Cognitive impairment, including dementia and delirium
- v. Dizziness (including orthostatic hypotension and vertigo)
- vi. Falls
- vii. Frailty
- viii. Hearing and visual disorders
- ix. Immobility and deconditioning
- x. Malnutrition and sarcopenia
- xi. Mental health in later life (including depression, substance misuse, loneliness and grief)
- xii. Parkinson's disease and other related disorders
- xiii. Osteoporosis and fragility fractures
- xiv. Pressure ulcers

(Continued)



**Table 5.** Continued

*3b: Graduates should be able to describe the relevant aspects of pathophysiology, diagnosis, management and preventative strategies for conditions and syndromes that fall within the wider remit of general internal medicine but increase in prevalence and change in their presentation and management with advancing age.*

**Section 4—Multidisciplinary team-working and services**

*4a: Graduates should understand and respect the roles and expertise of other health and social care professionals by:*

- i. Describing the roles and contributions of health and social care professionals commonly involved in the care of older people.
- ii. Gaining experience of how these professions work together in a multidisciplinary team and recognising the importance of team-working in delivering optimal care to older people.

*4b: Graduates should know about care of older patients in different settings and about specific aspects of health and social care in their region/country by:*

- i. Gaining experience of caring for older patients in various settings, and how these services work together, including: primary and community care, inpatient and outpatient hospital care across clinical specialities, inpatient and outpatient rehabilitation, institutional and non-institutional long-term care, and palliative and end-of-life care delivered in these settings and in hospices.
- ii. Describing the interaction between health and social services in the discharge of patients from hospital, the provision and funding of long-term care for older adults and describing what services are available in their region/country.
- iii. Defining the specialties that commonly work closely with geriatric medicine (stroke medicine, palliative medicine, old age psychiatry) and sub-specialties within geriatric medicine, and relate their contribution to the care of older adults in a regional/national context.

**Section 5—Prescribing in geriatric medicine**

*5: Graduates should understand the principles of treatment, including the appropriate and safe use of medicines as a basis for prescribing, by:*

- i. Describing the effect of ageing upon pharmacodynamics and pharmacokinetics.
- ii. Defining the concept of polypharmacy in older people.
- iii. Engaging in medicines optimisation with older patients, accounting for physiological differences, drug–drug interactions, multi-morbidity, frailty, adverse drug reactions and patient preference, and considering objective assessment tools available for medication reviews where appropriate (e.g. STOPP/START, STOPP/Fall, anti-cholinergic calculators and levodopa equivalence calculators).
- iv. Discussing the factors affecting medication concordance with older patients and the detection and management of drug underuse/overuse.
- v. Prescribing safely for the conditions defined in section 3, and to manage symptoms occurring at the end of life.

**Section 6—Ethicolegal aspects of geriatric medicine**

*6: Graduates should understand the main ethical and legal issues arising in the care of older patients by:*

- i. Applying the four ethical principles of autonomy, beneficence, non-maleficence and justice, in their approach to caring for older people.
- ii. Applying the ethical and legal frameworks relevant in their country that govern advance directives, assisted dying, cardiopulmonary resuscitation decisions, withdrawal and withholding of medical treatment, and artificial nutrition and hydration.
- iii. Demonstrating the ability to have sensitive discussions with patients, carers and other advocates around breaking bad news, conflict resolution, civility, cardiopulmonary resuscitation decisions and advance care planning.
- iv. Applying the principles of mental capacity to make decisions, understanding the concept of ‘best interests’ and being aware of the legislation which outlines and protects these principles in their country (e.g. Liberty Protection Safeguards, Power of Attorney, Independent Mental Capacity Advocates, Court of Protection).
- v. Recognising potential elder abuse and describing the appropriate steps to safeguard vulnerable patients, with an awareness of local safeguarding procedures.

**Section 7—Research in ageing and geriatric medicine**

*7: Graduates should understand the intricacies of undertaking and interpreting research in older people by:*

- i. Describing recent and predicted national and international trends in demography, epidemiology and healthcare costs related to ageing.
- ii. Being aware of national and international health inequalities and how these impact life expectancy and quality of life for older people.
- iii. Understanding the research and quality improvement methodologies employed to advance the care of older people.
- iv. Advocating for patient voice and codesign when participating in medical research teams.
- v. Describing the barriers to research in older people including: issues of sampling and generalisability, inclusion of participants with multimorbidity, functional and cognitive impairment and the associated ethical issues, issues of measurement and measurement bias.

**Updated BGS recommended curriculum**

The updated BGS recommended undergraduate curriculum in geriatric medicine is presented in [Table 5](#). This update reflects the desired learning requirements identified by the mapping and NGT processes outlined above. With group agreement, the curriculum has been re-structured into seven sections, each with one or two overarching LOs which are expanded and clarified in further sub-LOs, emulating the structure of the European curriculum. The consensus was that these LOs set the minimum level of knowledge, skills and attitudes required for the optimal care of older people,

which medical students must be able to demonstrate by graduation, echoed in the introductory statement to the curriculum.

**Discussion**

This update has brought the BGS recommendations in-line with GMC MLA requirements, providing a blueprint for medical schools as they update their curricula in preparation for the forthcoming MLA launch. Specialty curricula, such as these, which are produced by expert consensus

## Updating the British Geriatrics Society recommended undergraduate curriculum

and designed to meet GMC requirements, are useful for medical schools in the absence of a national curriculum [23]. This recommended curriculum may also prove useful for institutions in other countries, just as the European curriculum informed this update, and previous iterations of the UK curriculum were informed by guidance from Australia and America [24, 25]. However, in this update, our decision was to focus on curricula from the UK and Europe given major clinical and pedagogical differences in practice internationally, particularly when comparing UK practice to that in America. This may in turn limit the applicability of these recommendations outside of Europe.

The most striking difference between the curricula was the absence of any reference to clinical skills or active participation in the BGS curriculum when compared to the European curriculum. The implication, therefore, is that this updated BGS curriculum will better map to GMC standards, which include a list 'Clinical and Professional Capabilities' [18, 19]. Such requirements are mirrored in postgraduate medical training, where workplace-based assessments (Entrustable Professional Activities and Capabilities in Practice) focussed on clinical skill acquisition and 'sign-off' are commonplace. Integration of common assessment styles, spanning undergraduate and postgraduate training, would promote life-long learning and professional development. However, introduction of these workplace-based assessments into undergraduate learning first requires a curricular blueprint with appropriate clinically orientated guidance, which is achieved with this update.

Critically, frailty did not feature in the 2013 BGS curriculum, and is only referenced in a single LO in the 2014 European curriculum [12, 20]. This updated curriculum now extensively covers frailty across professionalism, pathophysiology, disease presentation, progression, treatment, and research to appropriately reflect the changes in population demographics and changes to how and what we learn; whereby medical graduates need the knowledge, skills and behaviours to look after patients with frailty in whichever speciality they choose. These new LOs align with GMC guidance on frailty in both undergraduate and postgraduate curricula, ensuring that frailty is consistently embedded across the continuum of professional learning and development [18, 19, 26].

The strength of this study is that a multi-stage independent mapping process and vNGT was employed to achieve a robustly cross-matched expert consensus in updating the BGS recommended undergraduate curriculum in geriatric medicine. A minor limitation of the vNGT process is a tendency towards consensus, rather than generation of novel ideas, especially in our relatively small group of 15 participants—however, those invitees who could not attend the vNGT contributed to the final update electronically. Furthermore, there is the potential for bias within the NGT, especially given that several participants hold, or have held positions within the BGS. However, the very nature of NGT minimises perceived hierarchies by offering every participant the opportunity to contribute equally, therefore by inviting stakeholders from a broad range of fields and backgrounds,

and in particular by involving undergraduate students as end-users of the curriculum, we have minimised this risk of bias.

We anticipate that through appropriate alignment and benchmarking of local curricula, these recommendations will help to standardise teaching and learning in geriatric medicine, producing graduates who are well-prepared for the care of complex older patients in every specialty. Our next steps are to draw on recent literature and the results of national surveys to produce an 'exemplar teaching methods' supplement, to aid medical schools in the implementation of these recommendations [4, 27, 28]. Moreover, using this updated curriculum as a blueprint, we will work with students and educators to develop an appendix of Entrustable Professional Activities and/or Capabilities in Practice. This will improve the integration of undergraduate and postgraduate medical training requirements, and better prepare students for professional practice post-graduation [29–31].

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