Title: Increasing the visibility of older people in medical education – a process of mapping and adapting to the British Geriatrics Society recommended curriculum

Short Title: A process of mapping to a recommended curriculum

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Abstract

Introduction: Medical education may not fully prepare graduates for managing an ageing population with an increasing frequency of multiple long-term conditions (MLTCs). Ongoing curriculum evaluation and adaptation is essential to ensure that medical education meets the needs of this group of patients. We present a case study of practical curriculum adaptation in response to changing patient demographics.

Methods: We mapped the University of Sunderland's (UoS) medical curriculum against the British Geriatric Society (BGS) Recommended Curriculum to identify gaps. Collaborating with faculty, we adapted the curriculum to enhance the coverage of BGS learning outcomes.

Results: The UoS curriculum fully covered 40.6% of BGS learning outcomes. However, 27.8% were not addressed, and only 19.4% of patient case studies featured patients aged over 65. Adaptations included updated patient case studies, new assessments, and specialised sessions on interprofessional learning and geriatric medical ethics.

Conclusion: This project demonstrates the potential for curriculum mapping to integrate essential learning outcomes for treating older and multimorbid patient populations. Our approach also offers a model for other medical schools aiming to improve the representation of other diverse patient groups in undergraduate education.

Keywords

Curriculum mapping, inclusive medical education, medical student, patient diversity, undergraduate

Introduction

In the rapidly evolving landscape of healthcare, medical education faces the critical challenge of preparing future physicians to meet the complex needs of an increasingly diverse patient population. As societal demographics shift towards greater longevity and the prevalence of multiple long-term conditions (MLTCs) rises, the scope of medical education must expand to equip students with the skills and knowledge to provide comprehensive care. This requires a curriculum that transcends traditional boundaries, emphasising holistic, patient-centred care that addresses the multifaceted challenges patients present, regardless of age, background, or health status. Integrating this broader perspective into medical education is not only essential for improving patient outcomes but also for fostering a healthcare environment that adapts to the changing dynamics of patient demographics and disease patterns.

Geriatricians are familiar with the high numbers of patients presenting to primary and secondary care, and across clinical specialties, who are affected by frailty syndromes and MLTCs. Although there is a trend towards better recognition of this population in education and training, curriculums at undergraduate (UG) and postgraduate (PG) level lag behind the well-established population changes in the UK and internationally, and so older people with MLTCs remain under-represented (World Health Organization Department of Ageing and Life Course and International Federation of Medical Student Associations, 2007; Gordon *et al.*, 2014). Accordingly, medical graduates are not necessarily equipped to manage the complexity of the patients that they see, and this may not be remediated during

their PG training (Brown *et al.*, 2023). Shortfalls in in education and training, alongside a National Health Service (NHS) system historically established to respond to the needs of a younger population with less complexity, go some way to explain why older people are more likely to receive substandard care (British Geriatrics Society, Royal College of Physicians London, and Royal College of Physicians Edinburgh, 2023).

In recognition of this deficit, the British Geriatrics Society (BGS) established a recommended National Curriculum in geriatric medicine in 2008 (Blundell *et al.*, 2009). The BGS curriculum was mapped to the General Medical Council's new Medical Licensing Assessment (MLA; a test that UK medical graduates will need to pass before joining the medical register due to be introduced in 2024-25), and updated through consensus using a Nominal Group Technique (Pearson *et al.*, 2023).

Major updates included the addition of frailty as a key topic, and the presence of end-of-life care skills as core to the role of a geriatrician. The curriculum also identified the advantages of longitudinal teaching of learning outcomes in preference to being isolated to geriatric medicine rotations. The curriculum serves as a tool for UK medical schools to assess their own learning outcomes and content in relation to geriatric medicine and identify areas for development and improvement. A similar option is available to European countries using the domains contained within a recommended European Undergraduate Curriculum (Masud *et al.*, 2014).

Finalising a consensus curriculum is only the first step in adapting and improving education and training about ageing and MLTCs at individual medical schools, and subsequently translating the associated knowledge, skills, and attitudes into better quality care for patients. Curriculum change is a notoriously laborious process – there are particular challenges for medicine given that population needs, and the evidence base, develop rapidly and incrementally, whilst the curriculum must necessarily remain static for a period of time. Further, the breadth of content competing for space, plus attention to changing societal values, can lead to "ideological battles" (Grant, 2019) over curriculum management. Specific curriculum development models are rarely evidence-based beyond the experiences and outcomes of a particular medical school – the needs of local patients, students and teachers means that a curriculum cannot be transplanted between medical schools, nationally or internationally.

Acknowledging the necessary diversity of the medical curriculum, the growth of numbers of older people with MLTCs is a longstanding trend that is due to accelerate (Whitty, 2023). Therefore, all medical schools should be considering to what extent their curriculum incorporates the needs of this patient group and what they can do to improve the education that their students receive before graduation (Tullo, Khoo and Teodorczuk, 2015).

The University of Sunderland (UoS), located in the North-East of England, welcomed its first intake of students in 2019. The annual intake is currently 100 students, including a mix of undergraduate-entry and mature students, with plans to expand to 300 students annually by 2030. UoS employs a spiral curriculum, which involves problem-based learning (PBL) in years one and two, case-based learning (CBL) in years three and four, and an assistantship model in year five. This approach allows students to build on their learning progressively, adding complexity to clinical problems introduced from year one onwards.

In years one and two, students are based at the university, where they learn the fundamentals of medicine through PBL sessions involving weekly simulated patient cases, alongside anatomy, clinical skills and communication skills sessions. Years three and four consist of clinical placements, where students rotate through dedicated clinical blocks in medicine, surgery, paediatrics, and psychiatry, alongside a specific four-week block in geriatric medicine in year three, and a specific six-week block in gynaecology, obstetrics, and sexual health in year four. In year five, the curriculum focuses on a student assistantship model, involving longitudinal placements in clinical environments to prepare students for work as junior doctors.

Geriatric medicine is primarily encountered by students through the dedicated four-week block in year three, which includes placements in geriatric medicine, palliative care, and stroke medicine. Additionally, students may engage with elderly care environments during their clinical placements in years four and five, although these opportunities are not guaranteed.

This paper presents a case study of a curriculum review at a UK medical school, specifically focusing on mapping the existing learning outcomes to the BGS Recommended Curriculum. Our primary objective was to identify gaps in the UoS MBChB curriculum regarding the education of older people with MLTCs and to enhance the visibility of these topics within the curriculum. Rather than undertaking a complete curriculum overhaul, we aimed to adapt and expand the current curriculum content to better cover these essential areas.

Methods

Our curriculum review involved both "curriculum monitoring" and "curriculum evaluation" (Changiz *et al.*, 2019). Monitoring is undertaken to assess the quality of a curriculum, in terms of which standards are met and where improvement might occur. In this case, the standard identified was the BGS Recommended Curriculum. Monitoring is both retrospective and prospective – a regular and systematic process to determine progress towards a standard. In contrast, curriculum evaluation aims to make an episodic judgement as to the value of a curriculum, including whether or not it is fit for purpose.

Learning outcomes from years one to four of the most up to date UoS MBChB curriculum were mapped to the BGS Recommended Curriculum 2023 to identify gaps regarding education around care of the older person and MLTCs. At the time of conducting this curriculum mapping, UoS did not yet have a fifth-year student cohort so no learning outcomes from year five were available to map.

Two reviewers compared the learning outcomes from both curricula to assess how well UoS covered the BGS Recommended Curriculum. The learning outcomes from the BGS Recommended Curriculum were classed as 'fully covered', 'partially covered' or 'not covered' depending on the match to those from the UoS curriculum. A fully covered learning outcome would have either multiple UoS learning outcomes mapped to it or one specific learning outcome mapped to it. A partially covered learning outcome may have one or two learning outcomes mapped to it that cover an aspect, but not all of the topic. A 'not covered' learning outcome had no equivalent learning outcomes matched by the UoS curriculum. The UoS learning outcomes were then mapped by the reviewers separately, and

any uncertain areas of mapping were discussed between the reviewers to come to a resolution.

Learning outcomes which were not 'fully covered' were defined as gaps. The gaps identified were then used to help identify areas for improving care of the older person education in the UoS curriculum. Opportunistic conversations and outreach to relevant educators was conducted to identify steps to remediate the gaps.

The average age of patients within relevant PBL/CBL cases was calculated to establish if the patients used in these cases accurately represented the patient population of the UK. Patient cases deemed not applicable to this project, such as paediatric cases, were excluded from the mapping process.

Results

Coverage and Gaps:

The UoS MBChB curriculum 'fully covered' 40.6% of the learning outcomes described in the BGS Recommended Curriculum. Section 3 of the BGS Recommended Curriculum, which covers specific age-related conditions, had the most fully covered learning outcomes (60% of learning outcomes). This is likely due to UoS having a dedicated four-week 'The Elderly Patient' block which contains learning outcomes relating to 'core conditions' which align closely with the BGS learning outcomes. Examples of these conditions include cerebrovascular disease, cognitive impairment, and falls. The mapping of UoS learning outcomes as compared to the BGS learning outcomes is available in Table 1.

TABLE 1 – Coverage of British Geriatric Society Recommended Curriculum Learning Outcomes by University of Sunderland MBChB Curriculum:

BGS Recommended Curriculum Section	Outcomes Fully Covered	Outcomes Partially Covered	Outcomes Not Covered	Non-Applicable Outcomes
1 – Foundations of Ageing and Geriatric Medicine	**4** (50%)	**2** (25%)	**2** (25%)	**0** (0%)
2 – Clinical Care of Older People	**5** (45.45%)	**2** (18.18%)	**4** (36.36%)	**0** (0%)
3 – Specific Age-Related Conditions	**9** (60%)	**4** (26.67%)	**1** (6.67%)	**1** (6.67%)
4 – Multidisciplinary Team-Working and Services	**2** (40%)	**3** (60%)	**0** (0%)	**0** (0%)
5 – Prescribing in Geriatric Medicine	**2** (40%)	**3** (60%)	**0** (0%)	**0** (0%)
6 – Ethicolegal Aspects of Geriatric Medicine	**0** (0%)	**2** (40%)	**3** (60%)	**0** (0%)
7 – Research in Ageing and Geriatric Medicine	**0** (0%)	**0** (0%)	**5** (100%)	**0** (0%)
Overall	**22** (40.74%)	**16** (29.63%)	**15** (27.78%)	**1** (1.85%)

Legend: BGS = British Geriatric Society

By contrast, 27.8% of BGS learning outcomes were not covered at all. Examples of sections not covered include ethicolegal aspects of geriatric medicine and research in ageing and geriatric medicine. One particular BGS learning outcome was challenging to match to the UoS curriculum – *'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*'. The breadth of this learning outcome meant that we could not determine if it were 'fully covered', 'partially covered' or 'not covered' by the curriculum.

Average Age of Patient Cases:

156 patient cases were identified across years one to four. 22 of these patients were not relevant to the project (e g. paediatric learning outcomes or age not stated). Of the 134 remaining patient cases, 26 (19.4%) were over the age of 65. Patients aged 70 years old or over accounted for only 18 (13.4%) of the patient cases. This is dramatically less than the 43.2% of patients aged 65 or over that accounted for hospital admissions in 2021-2022 (Centre for Ageing Better, 2022).

Curriculum Changes

Based on our findings we made the following changes to our curriculum:

1. **Patient cases**

To increase the visibility of older people and improve student understanding of acute and multiple long-term conditions, we updated our patient cases to include an older population with an increased number of comorbidities. For example, one case within the 'The Body's Defence' unit of year one focuses on soft tissue infections, specifically cellulitis in a 27-year-old male. The case covers the impact of the illness on the patient's job, the progression of the infection to sepsis and a hospital admission with a hyperactive delirium. Altering the case to be a 90-year-old male allowed the opportunity to introduce topics such as the impact of frailty on disease prognosis and the effect of an infection on an older person's functional status. Further, there would be the opportunity to discuss the services that may need to be involved prior to discharge, such as social care.

By applying these changes, we aimed to encourage group discussion around geriatric medicine topics that may not otherwise be covered, whilst keeping the core learning outcomes around sepsis recognition and the mechanism of action of common antibiotics. The intentional shift in patient age ensures that students are better prepared to navigate the intricacies of geriatric care upon entering clinical practice. It promotes a more realistic and representative educational experience, enhancing students' ability to recognise, understand, and address the diverse health needs of older patients.

2. **Primary Care (Shared Decision Making)**

Through dialogue with primary care academics at UoS, we were able to identify ways to introduce the needs of older people in the cases they used. Again, the task of adapting cases to fit an older, frailer, co-morbid population with the addition of some challenging social circumstances. For example, one of the primary care cases had a focus on teaching

students about discharge summaries, including information transfer between secondary care and primary care. By making a simple adjustment of increasing the patient's age and comorbidities, the case gained added complexity. This complexity more accurately matched the patient population that the students will be writing discharge letters for once they graduate.

3. **Year 5 Mock Ward and Simulation:**

During the period that this project was conducted, UoS did not yet have a finalised curriculum for year five students, allowing us some flexibility to introduce missing BGS learning outcomes. We introduced a half-day ward simulation session for students to rotate through different tasks that they may come across as a foundation doctor. Tasks included A-E assessments of acutely unwell patients, prescribing scenarios, and completion of discharge summaries. The setting of the session was changed from a 'general medicine' ward to specifically a 'care of the older person' ward. Through discussion with geriatricians, the scenarios within the session were changed to add a level of complexity to tasks associated with caring for older patients with multiple comorbidities. Examples include two A-E assessment scenarios – one covering a patient experiencing a posterior stroke, the other covering a patient with acute left ventricular failure. These pathologies were conditions that we felt were underrepresented in acute simulation scenarios in medical school and were important conditions to consider in older patients presenting with dizziness or dyspnoea, respectively.

Another change made to this session was to introduce an interprofessional learning (IPL) opportunity by jointly running the session with student nurses. Care of the older person as a speciality involves a significant amount of multidisciplinary team working. The inclusion of this element to the session aimed to enhance the 'real-life' context of the session and improve the situated learning that occurs (Stein, 1998).

4. **Medical Ethics**

Section 6 of the BGS Curriculum includes learning outcomes covering ethicolegal aspects of geriatric medicine. UoS did not fully cover any of these topics within its curriculum. Through discussion with colleagues, we discovered that some of these topics were taught in various other teaching sessions such as 'end of life' care. While it is reassuring that important aspects of geriatric medicine were covered elsewhere, we recognise the need for specific learning outcomes within the UoS curriculum to guarantee systematic implementation.

An ethics lead was employed by the university and given responsibility for revision of the ethics and law content within the medical curriculum. This member of staff was also a clinician with some experience in geriatric medicine. A new session called 'geriatric ethics' was introduced to year four students, specifically to address several of the learning outcomes articulated by the BGS.

This session was a series of case-based discussions, where each case exhibited a complexity that is typically associated with the care of older people. The tutor facilitated the identification and implementation of key ethical and legal principles, and selected this late stage in the medical course so that students are equipped with the cognitive and tacit knowledge to usefully integrate clinical complexity with ethicolegal complexity. This session

provided partial or full coverage of four learning outcomes from section 6 of the BGS Recommended Curriculum and one learning outcome from section 7.

In future, undergraduate ethicolegal training can be improved by the widespread incorporation of issues that are prominent in geriatric medicine that may be more latent in other areas. This includes attention to such themes as: decision-making in uncertainty, ambiguities in ascertaining 'best interests', individualised care in the context of disability and dependence, and the overarching goals of medicine as a whole. In addition, it may require a pedagogical culture change that is alert to the ageist consequences of sanitising cases of their clinical complexity for educational purposes.

5. Assessment

It is widely accepted that curriculum content is taken more seriously by students if it is formally assessed (Shumway and Harden, 2003). Designing valid and reliable assessment questions in geriatric medicine is challenging due to the heterogeneity of clinical presentations of the same condition, and a lack of evidence base or clinical guidelines around the management of multimorbidity. We aimed to address this by reviewing our existing question banks – single best answer questions (SBA) and observed structured clinical examination stations (OSCEs) – and identify gaps. We then introduced additional SBA questions on frailty, end of life care, and age-associated conditions such as Parkinson's disease and stroke, and an OSCE station focussing on taking a collateral history for a patient presenting with delirium.

Discussion

In the rapidly evolving landscape of healthcare, medical education must prepare future physicians for the complexities of an ageing patient population with MLTCs. This shift necessitates a re-evaluation of medical curricula to ensure that graduates are adept at managing the multifaceted needs of patients in a holistic manner. While the spotlight of this project has often been on geriatric medicine, the principles underlying the need for curriculum adaptation to match patient needs are universally applicable. Engaging in curriculum monitoring is vital for identifying areas for improvement and to adapt teaching strategies to address evolving healthcare needs. Moreover, there is a need for rigorous evaluation of curriculum changes to determine their success in achieving the intended outcomes.

There is a lack of robust methodology in relation to curriculum monitoring and evaluation, in part due to the diversity of curriculum models used across undergraduate medical education (Harden, 2001). Appropriate adaptations may need to be similarly diverse, taking into account existing strengths and weaknesses of the relevant curriculum model. We have provided a case study of curriculum adaptation that could be used by other medical schools to enhance the visibility of older people, or indeed other patient groups, in their own undergraduate teaching and learning.

Curriculum change is a complex process – the breadth and depth of a medical degree inevitably leads to curriculum crowing and competition, with adjustments in one area potentially impacting on another. However, none of the adaptations that we outline required additional "space" or the removal of other material. As such, our strategy minimised the risk of stoking rivalry or "ideological battles" between educators.

In our approach to curriculum review, we used a pragmatic approach to make immediate meaningful changes without the need for a curriculum overhaul. This process, combining curriculum monitoring and evaluation, was designed to assess the alignment of existing educational content with recognised standards, in this case, the BGS Recommended Curriculum. However, its true strength lies in its adaptability. By systematically mapping learning outcomes and identifying gaps, this method provides a structured framework that can be readily applied to explore the educational needs related to any complex patient group. Whether addressing the care of older adults, patients with chronic diseases, or those facing social determinants of health challenges, our approach could be applied elsewhere. It allows medical educators to undertake a comprehensive review of their curriculum to better prepare graduates to meet the diverse needs of all patient populations they will encounter in their practice.

Interprofessional collaboration, through the use of IPL, provides the opportunity to bring students from medicine, nursing, and wider allied health professions together in a collaborative environment mirroring real-world healthcare scenarios. As students from these diverse healthcare backgrounds collaborate, they gain a nuanced understanding of the unique healthcare needs and complexities faced by patients, regardless of age or health status. UoS currently has a medical school, a nursing school and other healthcare schools including paramedic sciences. This allows educators to draw on the expertise of faculty from other schools to offer a distinct perspective to the care of a wide range of patient groups.

The IPL approach also encourages the students to appreciate the contributions of various healthcare professionals, fostering teamwork and enhancing their ability to work seamlessly within an interdisciplinary geriatric team. In essence, IPL in a simulated geriatric ward not only enriches the educational experience but also better equips future healthcare professionals to meet the evolving demands of geriatric medicine.

We encountered some challenges to making curriculum changes, most notably variable faculty buy-in. We relied on other educators to look at the cases that they oversee and agree to update them. We achieved this with varying levels of success depending on the extent to which each educator agreed with our rationale. We found that primary care academics and clinicians were the most engaged and amenable to potential changes. This may be because we have a primary care academic team based at the university who have more dedicated time within their work schedule to adapt cases and respond to queries than our hospital-based block leads who often have only one half-day a week on average dedicated to medical education. Despite our best efforts, older people remain under-represented in our assessments.

Evaluation of the outcome of curriculum change is also challenging (Santen *et al.*, 2018). Authors such as Fleming *et al.* (2015) advocate for focusing on student course ratings as a valid indicator of teaching effectiveness. However, in this context, our objective is to produce graduates who are competent to manage complex patients with MLTCs – students are unlikely to be able to self-assess their ability to do so prior to graduation. Longstanding medical schools are in a position to evaluate parameters such as learning environment ratings and national licensing scores before and after major curriculum changes to determine impact (Sullivan *et al.*, 2022). As a new medical school, implementing our curriculum for the first time, it is not possible for us to make this type of pre-post comparison. One potential option would be for us to adopt qualitative methodology to

explore how prepared our graduates felt to care for patients with MLTCs in different clinical environments, with retrospective consideration of the impact of their curriculum, in a similar manner to Brown *et al* (2023).

Conclusion

This study underscores the critical need for continuous curriculum evaluation and adaptation in medical education, particularly in light of demographic shifts towards an ageing population with increasing MLTCs. By mapping the UoS medical curriculum against the BGS recommended curriculum, significant gaps were identified in the coverage of geriatric learning outcomes.

Our targeted interventions, including updated patient case studies, new assessments and specialised IPL sessions, have enhanced the curriculum's capacity to prepare future physicians for the complexities of geriatric care. The process and outcomes of this curriculum adaptation offer a valuable framework for other medical schools seeking to integrate diverse patient groups into their educational programs.

Ultimately, embedding comprehensive geriatric education into the medical curriculum is essential to equip graduates with the necessary skills and knowledge to provide high-quality care for older adults. This initiative not only aligns medical education with the current demographic realities but also promotes an inclusive approach that benefits the broader healthcare system. We cannot provide a blueprint to ensure a curriculum is concordant with the BGS recommended National Curriculum, but we hope that we have provided some examples of practical and rapid adaptations to inspire others.

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Disclosure Statement

The authors declare that they have no competing interests.

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