How does the introduction of a new year three GP curriculum affect future commitment to teach? An evaluation using a realist approach

Michael Harrison and Hugh Alberti

School of Medical Education, Faculty of Medical Sciences, Newcastle University Newcastle upon Tyne UK

ABSTRACT
In western countries, there is a trend towards increasing amounts of undergraduate medical education being delivered in General Practice (GP). However, many medical schools report difficulties with the recruitment and retention of GP clinical teachers. Newcastle University recently introduced a new year three GP curriculum, involving an increased quantity of community-based teaching and changes to the responsibilities of GP clinical teachers. We sought to explore and explain how this curricular change affects the future teaching commitment of year three GP clinical teachers. We adopted a realist approach. We firstly developed a candidate theory of how the new curriculum may affect future teaching commitment. Data collection and analysis then involved interviews of 10 GP teachers to refine this theory and produce a final Programme Theory. The results suggest that different teachers are affected in different ways, influenced by practice and individual contexts. Some parts of the new curriculum tend to reduce future teaching commitment, whereas other aspects tend to increase commitment. Mechanisms include changes to autonomy and sense of value. The results allow medical schools to better understand how GP teacher retention can be facilitated during curricular change. We make numerous recommendations, including advocating a team-based approach to teaching, paying attention to teacher autonomy, and considering patient contact in relation to generalist, primary care-orientated medicine as a core component of GP teaching.

Background
Future graduates must be capable of providing general medical care across a range of specialities, regardless of future career intention [1]. General Practice (GP) provides an ideal learning environment for medical students to acquire such skills, affording opportunities to practice clinical and communication skills and develop an understanding of the integrated clinical and social sciences underpinning medicine [2]. An association has been demonstrated between the quantity of authentic undergraduate GP teaching and subsequent entry into GP Speciality Training [3]. Hence, increasing the amount of undergraduate teaching in GP may help improve GP recruitment.

The importance of community-based undergraduate learning is reflected in recommendations advocating an increase in the amount of undergraduate teaching delivered in GP [4,5]. However, the amount of GP teaching has plateaued since 2002, currently representing 9.2% of clinical teaching in undergraduate medical curricula [6]. Nevertheless, the majority of UK medical schools plan to increase the amount of teaching delivered in GP at their institution [6]; and targets have been suggested for 25% of undergraduate clinical learning to be in GP [2,7].

A lack of GP clinical teachers may be a barrier to GP teaching expansion. Recruitment and retention of GP teachers is problematic for many medical schools [8]. GP is currently experiencing unprecedented pressures, with rising clinical workload relating to a GP recruitment and retention crisis [9]. The barriers and facilitators to GPs taking on teaching responsibilities have been reported (Table 1 [10–21]).

The impact of curricular change on teacher retention is less well explored. Harding and Sweeney [20] found that, as teaching quantity increases, GP teacher motivation may reduce, and concerns over teaching organisation and administration appear. Two factors appear to protect against this: adequate investment in manpower and premises; and practices considering themselves as teaching practices. Others studies have suggested that practice benefits associated with expanded GP teaching.
may be offset by disbenefits [19,22]. However, to the best of the authors’ knowledge, minimal empirical literature exists specifically exploring the impact of changes to teaching responsibilities on teacher commitment.

Through the introduction of a revised year three curriculum at Newcastle University, we were in a unique position to explore the influence of new curricular approaches on GP teacher commitment. We hoped that lessons could be learnt that may be transferable to other academic institutions. Given the wide variety of contexts in which curricular reform occurs, we felt that this may be best appreciated through adopting a realist approach. We aimed to explore which aspects of the new year three curriculum increase, and conversely reduce, the commitment of year three GP clinical teachers to continue being involved in year three clinical teaching; and explain how and why this occurs.

Methods

Study design

Realist approaches are theory driven, aiming to develop and test evolving theory to explain how a programme works [23,24]. Realist approaches are concerned with answering the question “What works for whom, under what circumstances, in what respects, and why”, by establishing links between context, mechanism and outcome [24]. Context refers to the setting for the intervention [25] and may include social features and make-up of participants [26]. Mechanisms focus on how interventions affect the reasoning and decision-making of individuals [27]. Outcomes are the impact that follow from the action of one or more mechanisms in a given context [24]. Social programmes are thought to change the resources available to participants and, therefore, the context for those participants [28]. Identifying the relationship between context, mechanism and outcome, known as CMO-configurations (CMO-C), is the basis for generating and refining theory [24]. Realist research aims to produce middle-range theory [29]. We signpost the reader to relevant further reading [23,24,26,28,30].

Programme description

Newcastle University medical school has a yearly student intake of 370 students. The amount of GP teaching increased from 7 to 12.2% as part of a new curriculum introduced in the 2017/2018 academic year. The wider curriculum revisions include changing the early years to a case-based curriculum, an emphasis on the flipped classroom model, and increasing patient contact time in the later years. In addition to the increase of time students spend in GP in years three, four and five, there is an increased emphasis on students consulting with ‘real’ patients in parallel surgeries.

The new GP year three curriculum, commenced in the 2019/2020 academic year, has changes to teaching content, types of teaching activities, and role of the GP teacher. A substantial number of core clinical topics that were previously delivered in a hospital setting have been shifted for delivery in a community setting. Each tutorial contains a specific lesson plan with set learning outcomes, delivered using the flipped classroom approach. There are increased opportunities in semesters two and three for patient contact as a result of an additional half day in GP each week. Other novel roles and responsibilities for third year GP clinical teachers include academic mentorship for students attached to the practice. Remuneration for GP teaching has increased from £75 to £85 per student per session. A detailed summary of the changes is available online as an appendix.

Realist approach

We followed Pawson and Tilley’s four-stage process to guide the evaluation [24]:

Stage 1: Theory

We adopted an informal, eclectic approach to speculate how teacher commitment may be affected by the curricular changes. This included getting informal feedback

| Barriers                                      | Facilitators                                      |
|----------------------------------------------|---------------------------------------------------|
| Tension between clinical workload and teaching responsibilities, such as lack of time and space | Giving more recognition to teaching as a clinical professional activity |
| Inadequate remuneration                      | Providing adequate remuneration for teaching      |
| Lack of support from the practice or medical school | Encouraging interactions with the medical faculty and creating a sense of belonging to the medical school community |
| Increased workload from teaching             | Having a positive practice teaching ethos         |
| Organisational challenges                    | Reducing the burden on GP practices by providing a variety of teaching opportunities and flexibility. |
| Lack of confidence                           | Emphasise personal enjoyment and interest in teaching |
| Not feeling part of, or identifying with, the medical school or wider teaching community | Having adequate time to teach |
from GPs teaching the new curriculum during our local academic team meetings, using personal ‘hunches’, review of background literature on GP teacher retention and relevant substantive theory.

**Stage 2: Hypotheses developed into Initial Programme Theory (IPT)**

These speculations were used to create a candidate, explanatory theory (IPT) of how the new year three curriculum may affect future teaching commitment.

**Stage 3: Data collection and analysis to test and refine IPT**

We conducted individual interviews of 10 GP teachers to test and refine the IPT.

**Stage 4: Programme specification**

A final Programme Theory (PT) was developed, outlining which aspects of the curriculum affect future commitment, in what contexts, how and why.

**Participants and recruitment (Stage 3)**

Email invites were sent to current third year GP teachers using the university’s mailing list. Interested participants were then contacted by email to arrange interviews. Sampling was ‘theory-driven’, initially selecting participants with a range of contextual characteristics, then choosing participants specifically because they were in a position to shed light on a certain aspect of evolving theory. We gleaned initial contextual information about participants through local knowledge of the GPs and practices. Participants must have had recent experience of teaching on the ‘old’ year three curriculum. Participants were given written information about the study. Written consent was obtained. Participation was voluntary with no incentivisation.

**Data collection and analysis**

MH carried out the interviews between February and June 2020. Specific contextual information (see Table 3) was gained from each participant. Interviews were then conducted using realist interviewing techniques [24]. The interview schedule was available on-line as an appendix. We used Gilmore et al.’s approach to data analysis [31]. We initially coded transcripts for observable CMO-Cs in N-Vivo. We used the coded CMO-Cs to continuously refine the IPTs, which were split into further categories (re-labelled PT). As further transcripts were analysed, codes were applied and mapped to pre-existing CMO-Cs or, if new CMO-Cs were observed, mapped to relevant refined PTs. We thoroughly documented the theory refinement process. We based the write-up on RAMESES reporting guidelines [32].

**Reflexivity**

MH and HA are GPs with an interest in GP undergraduate teaching expansion. HA is responsible for Newcastle University Medical School’s GP education programme. We acknowledge that our positioning may have impacted our interpretation of the data and the subsequent write-up.

**Results**

**Stages 1 and 2**

Three initial CMO-Cs constituted an IPT (Table 2).

**Stages 3 and 4**

Contextual information about participants, and details of the length of interviews, are included in Table 3. Five CMO-Cs formed a final PT (Table 4).

**Overview of PT**

Different teachers are affected in different ways, influenced by practice and individual contexts. Increased teaching demands associated with the new curriculum tend to reduce future commitment when GPs feel unsupported by their practice. Some GP teachers experience a reduction in autonomy, and subsequent future commitment, relating to increased teaching prescription. Other aspects of the curriculum have a tendency towards increasing teacher commitment. This includes opportunities to facilitate patient contact, take on new responsibilities and teach generalist medicine. Mechanisms relating to identity and sense of value appear to be at play. Increased remuneration also tends to increase engagement with teaching.

| Table 2. CMO-Cs constituting Initial Programme Theory (IPT). |
|-------------------|-------------------|-------------------|
| **Context** | **Mechanism** | **Outcome** |
| **IPT1** | Change in curriculum i.e. Increase in teaching required, opportunities to teach core clinical topics | Increased sense of responsibility and increased motivation to teach | Increased personal engagement and interest in third year teaching |
| **IPT2** | Opportunity to promote GP more to students | Increased sense of value of being a GP and a GP teacher | Increased personal engagement and interest in third year teaching |
| **IPT3** | Increased finances provided for teaching in GP | Increased motivation due to perception of funds | Increased financial benefits for practice |
Table 3. Details of participants and interview length.

| Participant | Sex (M/F) | Age bracket | GP type (salaried, partner, locum) | Size of practice (small, medium, large) | Practice demographic (rural, semi-rural, inner city) | Years involved in undergraduate primary care teaching | Also a GP or F2 trainer? (yes (Y) or no (N)) | Do you consider the practice to have a strong teaching ethos? (yes (Y) or no (N)) | Does practice have any of the following learners? GP trainees/F2s (yes (Y) or no (N)) | Length of interview (minutes) |
|-------------|-----------|-------------|-----------------------------------|----------------------------------------|-------------------------------------------------|----------------------------------------|------------------------------------------|------------------------------------------|-----------------------------------------------|----------------------------------|
| 1           | F         | 30-39       | S                                 | SR                                     | 5                                               | N                                      | Y                                        | N                                        | Y                              | 33                               |
| 2           | F         | 30-39       | Other                             | L                                      | 4                                               | N                                      | N                                        | Y                                        | Y                              | 34                               |
| 3           | F         | 50-59       | P                                 | M                                      | 14                                              | N                                      | Y                                        | Y                                        | Y                              | 38                               |
| 4           | M         | 50-59       | S                                 | M                                      | 25                                              | Y                                      | N                                        | Y                                        | Y                              | 38                               |
| 5           | F         | 30-39       | P                                 | M                                      | 12                                              | Y                                      | Y                                        | Y                                        | Y                              | 30                               |
| 6           | F         | 50-59       | P                                 | S                                      | 19                                              | N                                      | Y                                        | Y                                        | Y                              | 40                               |
| 7           | F         | 30-39       | S                                 | L                                      | 5                                               | N                                      | Y                                        | Y                                        | Y                              | 32                               |
| 8           | F         | 40-49       | P                                 | M                                      | 6                                               | Y                                      | Y                                        | Y                                        | Y                              | 41                               |
| 9           | M         | 30-39       | Other                             | S                                      | 3                                               | N                                      | N                                        | Y                                        | Y                              | 40                               |
| 10          | F         | 30-39       | P                                 | IC                                     | 4                                               | N                                      | Y                                        | Y                                        | Y                              | 27                               |

CMO-C1: The impact of increased teaching demands

Participants reported that the curricular changes resulted in an increase in workload. A significant amount of preparation time was required to teach a specific clinical topic each week. Other demands stemmed from additional responsibilities, for example, reviewing students’ e-portfolios. However, the impact of increased demands was different in different participants. A practice’s approach to teaching, particularly the level of support available to the GP teacher and practice teaching ethos, appeared to influence whether future teaching commitment was adversely affected by the increased workload.

Some GP teachers felt supported by their colleagues. These teachers often identified as working at a practice with a strong teaching ethos. These practices utilised a wide range of team members to manage teaching capacity, and teaching was seen as a shared practice effort. This helped promote a sense of collective responsibility for teaching, reduce the personal stress on a lead GP teacher and preserve engagement with teaching. Non-human resources, such as common room space for studying and consulting rooms, also appeared to facilitate maintenance of capacity in the face of increased teaching demands.

The workload is definitely more … but it’s really positive because it’s always been a teaching practice and everyone understands the commitment that it takes to teach. (Participant 1)

Other GPs felt unsupported with their teaching and less able to draw on colleagues for help. These teachers often identified as working at a practice with a weak teaching ethos, citing staffing problems and clinical strain resulting in prioritisation of clinical provision over teaching. These teachers reported that the additional workload and responsibility caused them personal stress, which tended to diminish their interest and engagement with teaching.

our practice has had a difficult time … workload pressures are difficult … it’s difficult for me because I can’t ask anyone for support very much. (Participant 2)

CMO-C2: The impact of prescribed lesson plans

Participants felt that teaching specific clinical topics each week, accompanied by pre-designed lesson plans with set learning outcomes, represented a much higher degree of prescription in comparison to the ‘old’ curriculum. Some participants felt that this reduced their ability to react flexibly to students’ learning needs and to be opportunistic with clinical learning encounters. These participants appeared to experience a reduction in autonomy, which negatively affected their teaching engagement.

I think it’s taken all the joy out of 3rd year teaching … having a timetable that’s stuffed with learning outcomes has meant that basically the opportunities to do things have been curtailed. (Participant 6)

However, different teachers were affected in different ways. It was noted that some teachers were prepared to run the sessions according to their personal judgment but others felt obliged to stick rigidly to the university’s lesson plans. As a result, some teachers experienced no or minimal reduction in autonomy, whereas others reported significant losses of autonomy. It appeared that the main contextual factor influencing this was the teacher’s own personal response to being given this instruction (presumed control orientation): we theorised that GP teachers who tended to feel obliged to stick rigidly to the lesson plans probably had a natural, personal tendency to operate in a less autonomous manner when faced with external directives, whereas teachers who were prepared to deviate from lesson plans probably had a natural personal tendency to operate in a more autonomous manner.

CMO-C3: The impact of taking on new roles and responsibilities

Participants felt that the new curriculum offered opportunities for GP to take a more active role in undergraduate teaching. They commented that hospital-
Table 4. CMO-Cs forming final Programme Theory (PT).

| CMO-C constituting Final PT | Context (C) | Mechanism (M) | Outcome (O) |
|----------------------------|-------------|---------------|-------------|
| **CMO-C1: The impact of increased demands from teaching** | C1- increased teaching demands | M1- sense of collective responsibility for teaching | O- practice maintains capacity to meet increased demand from teaching, with subsequent maintenance of personal and practice engagement with, and interest in, third-year teaching |
| | C2- positive practice teaching ethos, with teaching responsibilities shared across multiple staff members and adequate human and non-human resources for teaching | M2- mobilisation of practice resources (including human resources) | |
| | C3- adequate perceived teacher competence | M3- reduced personal stress on lead GP teacher | |
| **CMO-C 2: The impact of prescribed lesson plans** | C1- prescribed lesson plans with fewer opportunities for patient contact | M- reduction in autonomy | O- reduced personal engagement, and interest in, third-year teaching |
| | C2- teacher tendency towards controlled (causality) orientation | | |
| **CMO-C 3: The impact of opportunities to take on new roles and responsibilities** | C1- opportunity to take on new teaching roles and responsibilities that were previously undertaken by the hospital (enabling increased opportunities to promote GP to students) | M1- increased sense of value | O- increased engagement with, and interest in, third-year teaching |
| | C2- adequate perceived teacher competence | M2- increased sense of responsibility | |
| **CMO-C 4: Different opportunities to teach primary care orientated medicine and facilitate patient contact** | C- opportunity to teach generalist/primary care orientated medicine, with focus on facilitating patient contact | M1- increased intrinsic enjoyment and teaching satisfaction | O- increased personal engagement, and interest in, third-year teaching |
| | | M2- fitting with identity of self as a generalist | |
| | | M3- increased motivation | |
| **CMO-C 5: The impact of increased finances provided for teaching** | C- increased finances provided for teaching | M- increased motivation due to perception that remuneration is now adequate to maintain clinical capacity and avoid financial loss | O- increased practice engagement with undergraduate teaching |

Based teaching had previously taken responsibility for many aspects of teaching, and that providing GPs with additional responsibilities acknowledged the importance of GP as a learning environment and a speciality. Participants felt that students tended to view GP as secondary to hospital-based medicine. They were keen to address this by showing students the benefits and value of GP. They felt that the changes in the curriculum allowed them to promote GP more to students.

*So I think the move to primary care is a really good thing and ... it is valuing the profession more.* (Participant 5)

However, a necessary contextual factor for this CMO-C was adequate perceived teacher competence. Whilst participants felt that training and support from the university was adequate, some teachers questioned whether they had the required knowledge or skills to teach certain topics. This was particularly true for specialist clinical topics that had now shifted to GP. Some teachers questioned the appropriateness of these topics being delivered by GPs.

*I suppose sometimes you don’t feel you really have much of the skill set to teach it, so you’re teaching something you’re not very familiar about . . . there was one session early on that I thought ‘look I just can’t do this’.* (Participant 4)

**CMO-C4: Different opportunities to teach primary care-orientated medicine and facilitate patient contact**

Participants commented that changes to the curriculum had affected their ability to facilitate patient contact in both positive and negative ways, with examples of increased and reduced opportunities for patient contact at different times during the new year three. Participants commented that facilitating patient contact increased their own personal enjoyment in teaching. They particularly valued seeing students make progress clinically. Personal teaching satisfaction was greatest when participants could use patient contacts as a basis to discuss issues relating to generalism. Teachers were generally less interested and engaged when required to teach clinical areas perceived to be less relevant to GP, for example, specialist clinical subjects, or activities that do not include any patient involvement or discussion.

Further analysis highlighted identity as a mechanism. Participants appeared particularly proud of their generalist medical background and knowledge. We noted that many participants talked about GP and its role in providing patient care using language suggesting pride in GP and generalism: one teacher described the ‘beauty’ of GP, whereas another teacher discussed the ‘joy’ of
teaching in a GP environment. It was felt that this linked to their identity as a generalist: GP teachers were ‘proud generalists’ who identified as generalist doctors and teachers of generalist medicine. GP teachers were more engaged when the subjects they were teaching fitted with their own personal identity as a generalist.

I love GP . . . it’s that moment-to-moment problem solving and getting that deeper understanding of your patient and that relationship that happens over time. (Participant 8)

**CMO-CS: The impact of increased finances provided for teaching**

Participants felt that providing increased finances for teaching made them more likely to continue teaching in the future. Most participants felt that money in itself was not the main reason to take medical students: they were primarily motivated to teach for intrinsic reasons, such as the enjoyment gained from teaching. However, money was recognised as an increasingly important factor in determining whether practices were able to take on medical students. Many participants commented that previous remuneration was not adequate to replace clinical sessions that were ‘lost’ as a result of teaching. For some practices, this had resulted in them relinquishing their teaching responsibilities. Participants often talked about the need to avoid financial loss and ensure maintenance of clinical capacity whilst taking medical students, and that this was particularly important given the current workforce and financial pressures affecting GP. The vast majority of GPs perceived that the increased remuneration for teaching now represented adequate compensation for ‘lost’ clinical time, which prevented financial loss and reduction in clinical capacity. This was a strong motivator for them to continue taking students.

there was a pause for a period of time when we did not take students . . . the money that we were receiving for the 3rd years previously wasn’t sufficient remuneration for all the energy, time and effort. (Participant 9)

**Discussion**

**Introduction**

Our study has demonstrated how curricular reform can influence GP teacher commitment. For GP teaching to play a central role in under-graduate teaching, GPs must remain strongly committed as community-based teachers. Our study has highlighted potential facilitators and barriers to teacher engagement during curricular change.

**A balancing act between prescription and tutor freedom?**

Extending the range of topics delivered in GP will inevitably involve some prescription by medical schools to ensure curriculum learning outcomes are met. Our results suggest that this needs to be carefully balanced against loss of teacher autonomy. Similar arguments have been made in relation to a national GP undergraduate curriculum [33]. GPs and their practices often have their own approach to teaching, and autonomy and flexibility are important to them. Our study also highlights the value placed by teachers on being able to facilitate patient contact and teach generalist medicine. This fits with some of the previous literature on the subject. Van de Zwet et al. discussed how students in GP require ‘developmental space’, achieved through ‘participatory activities’ [34]. Park et al. conceptualised GP teaching as a distinct socio-cultural space for learning about ‘real world medicine’, in which the GP tutor acts as a ‘broker’ for patient consults [35]. Other studies have discussed the role of the GP tutor in terms of providing students with a breadth of experience [36,37].

**A generalist identity?**

Identity has previously been discussed in the literature in relation to teacher recruitment but from a group membership perspective [10]. Our study views identity from a different yet potentially complementary perspective. In our study, engagement was negatively affected when teaching activities did not fit with GP teachers’ self-views as generalists. Thus, we conceptualise identity in terms of congruency between teaching activities and GPs’ own perceptions of their role [38]. Whilst our conceptualisation differs to that by Barber et al. [10], we suggest that there may be a common system of meanings between the two in relation to the shared group and individual values of GP teachers. We speculate that GPs may reflect on their teaching role as generalists on an individual and wider medical school community-based level: GP teachers seem to value the unique contribution GP teaching makes in showcasing generalist principles to students, within the context of the wider medical school curricula. GP teachers seem to perceive that GP teaching ought to mutually complement, but not necessarily replace, hospital-based teaching; and we speculate that a sense of uniqueness with respect to their role may enhance their sense of value as teachers.
Increased workload in a pressured system

Previous literature has suggested that undergraduate teaching creates additional GP workload [16,39–41]. Our study suggests that curricular change may increase teacher workload further. Investment for resourcing and infrastructure for GP teaching is lacking: 7% of medical schools report not investing in practice premises to encourage expansion of GP teaching, and there is marked variation in administrative support across medical schools [8]. We speculate that workload issues may be exacerbated by traditional models of GP under-graduate placement, particularly practices working in isolation with single GPs taking responsibility for under-graduate teaching. This model may be unable to withstand increased pressures associated with larger numbers of students spending more time in GP in an already pressured system.

Our results highlight the importance of a team-based, collective approach to undergraduate teaching and a positive practice teaching ethos. Our results agree with the previous literature on this subject. Harding et al. [20] suggested that adequate resourcing for teaching, and support from colleagues and teaching institutions, protected against diminishing motivation. Similarly, Barber et al. [10] found that teaching–service tensions were reduced when multiple clinicians and members of the wider healthcare team were involved in teaching.

An inadequate primary care tariff?

Previous studies have highlighted the importance of adequate remuneration [14,16]. There is a significant variation in funding allocated to GP teaching across UK medical schools [8]. Average UK payment per student per session is £55.60, falling below estimated costs to practices [6]. The Department of Health and Social Care in England has for the first time introduced a national minimum tariff for medical student placements in GP [42]. This still falls significantly short of the current tariff for secondary care undergraduate medical placements and the actual cost to practices [43,44]. Interestingly, this differs from views of GP teachers within this study, who perceived that funding was now sufficient to avoid financial loss. The reason for this discrepancy is unclear, and should be an area for future research.

Implications for research and practice

A summary of recommendations is provided in [Figure 1. We suggest that medical schools recommend a practice team-based approach to under-graduate GP teaching, with shared teaching responsibilities across a range of clinical and administrative staff. Medical schools also need to ensure GP practices have adequate human and non-human resources for teaching, including room space and administrative support. This will require investment and funding, with adequate teaching remuneration. We echo the words of Alberti et al. [45] that

Summary of recommendations for medical schools

1. Medical schools ought to provide adequate support to practices to ensure adequate human and non-human resources for teaching.
2. Medical schools ought to recommend a whole team practice-based approach to undergraduate primary care teaching, and provide practical advice on how this may be facilitated within practices.
3. Medical schools ought to ensure maintenance of teacher autonomy is carefully considered during curricular change associated with under-graduate primary care teaching expansion.
4. Careful consideration ought to be given regarding the future role of the GP teacher and the types of topics taught in primary care. Clinical topics that teach and promote generalist, primary care- oriented medicine and facilitate patient contact ought to be considered core parts of primary care teaching and learning.
5. Medical schools need to ensure adequate remuneration for clinical teaching in all medical schools and resolve discrepancies between primary and secondary care remuneration.
6. Medical schools ought to implement strategies to strengthen teacher identity and sense of value as educators. We suggest that this may be achieved through activities that increase interaction, networking and engagement at practice, community-based and medical school levels:
   - Practice-based activities include encouraging the fostering of positive practice teaching ethos and collective approaches to teaching within practices;
   - Community-based activities include initiatives to allow collaboration and sharing of teaching ideas between local teaching practices;
   - Medical school activities include opportunities for GP teachers to connect with the wider medical school community through teacher development initiatives, staff workshops and on-line forums.

Figure 1. (a) A PGT (b) its graph.
governing bodies ought to resolve payment discrepancies between primary and secondary care by moving to a fair and flat tariff for undergraduate placements. We also agree with Pope and Dubras [46] that there is a need to pilot and evaluate novel collaborative approaches to the education of medical students. Alternative models of primary care organisation and delivery have been suggested, such as collaborative working between practices and inter-professional models [7,47,48]. We recommend further research exploring novel ways of delivering community-based medical education.

We recommend that medical schools carefully balance teacher autonomy against the need for prescription of curriculum content during curricular reform. Medical schools may choose to provide increased choice for GP teachers by offering a range of teaching opportunities that align with both GP and practice preferences. Careful consideration also ought to be given to the types of clinical topics taught in GP. We recommend that patient contact and the teaching of generalist medicine are considered core components of GP teaching. We recommend medical schools carefully consider how teacher identity and value may be strengthened on an individual, practice-based and wider medical school community level. We suggest that this may be achieved through activities that increase interaction, networking and engagement on numerous levels, as outlined in Figure 1.

**Strengths and limitations**

We feel that the use of realist methodology is a strength because it has enabled production of contextually dependant recommendations. This increases the usefulness of the findings because results can be applied to medical schools with widely differing and heterogenous curricular design.

The study used 10 interviews. It was noted that, by the tenth interview, there were minimal new emerging ideas, thus suggesting data saturation.

MH was the principal interviewer and analyst. Whilst we acknowledge that this may be a limitation of the study, significant attempts were made to mitigate the risk bias through discussion with team members and a thorough audit trail.

At the time of the first interview, the new third-year curriculum had been in operation for six months. A longitudinal assessment is indicated to help understand the longer-term impact of this curricular change on teaching commitment.

Third-year teaching during the 2019/2020 academic year was disrupted because of the Covid-19 pandemic, with cancellation of face-to-face GP teaching at Newcastle University in April 2020. Interviews for this study spanned this period. It is accepted that participants views may have been affected by this unprecedented situation.

This study involved an evaluation at a single site. We recommend replication of this study in other institutions, with synthesis across settings.

**Conclusion**

This study has highlighted how the introduction of a new GP curriculum can affect both positively and negatively future teaching commitment. The results allow medical schools to better understand how GP teacher retention may be facilitated during future primary care teaching expansion. Medical schools need to support practices to manage increased teaching workload, maintain teacher autonomy and strengthen teacher identity.

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**ORCID**

Hugh Alberti [http://orcid.org/0000-0002-8542-9599]

**Ethics**

Ethical approval was granted by Newcastle University (Ref: 18,635/2019)
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