

Discussion

COGConnect: A new visual resource for teaching and learning effective consulting



Trevor Thompson^{a,*}, Lizzie Grove^a, Juliet Brown^a, Jess Buchan^a,
Anthony L Kerry^c, Sarah Burge^b

^a Centre for Academic Primary Care, School of Population Health Sciences, University of Bristol, Bristol, BS8 2PS, UK

^b Bristol Medical School, University of Bristol, 69 St Michael's Hill, Bristol, BS2 8DZ, UK

^c Department of Respiratory Medicine, Western Hospital NHS Foundation Trust, Swindon, SN3 6BB, UK

ARTICLE INFO

Article history:

Received 9 January 2020

Received in revised form 22 November 2020

Accepted 16 December 2020

Keywords:

Communication skills

Consultations skills

Consultation skills teaching

Medical students

Medical education

Clinical reasoning

Self-care activation

ABSTRACT

Objective: Consultation skills are essential to clinical practice and, when effective, can facilitate diagnoses and improve patient satisfaction. Various models exist to facilitate consultation teaching. These can be prescriptive, a challenge to apply in clinical settings and are often designed for primary care. In redesigning our entire curriculum, we sought to create a new visual, digital, resource for consultation teaching, aligned with statements from the UK Council for Clinical Communication (UKCCC), and suitable for the evolving expectations of patients, clinicians and the UK NHS, in 21st century medicine.

Methods: We conducted a literature review encompassing teaching methods, NHS Priorities, patients' priorities, lifestyle interventions and practitioner resilience. COGConnect was designed iteratively through consultation with a graphic designer, health psychologists, a range of clinicians, and a consultation expert, and has evolved through extensive use in our new "effective consulting" course in primary and secondary care.

Results: COGConnect is deliberately visual, iterative, bi-directional and multi-phasic. The central image of COGConnect is two persons in connection; the floating cogs suggesting an encounter of different agents who must adapt their cog-connection in terms of speed, direction and dimension. Around this image we place five core values. The consultation phases are represented by ten colourful cogs, with important additions including 'formulating', 'activating' and 'integrating'.

Conclusion: COGConnect builds on the strengths of existing frameworks and provides a strong visual resource suitable for digital learning. It offers greater emphasis on explicit clinical reasoning, activation of patient self-care and learning from the interaction. Having become the *de facto* resource for consultation skills training across primary and secondary care in our institution, the next phase is to develop the COGConnect.info website and a programme of formal evaluation.

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1. Introduction

The medical consultation is at the heart of any clinical interaction; it is an essential component of undergraduate student learning and a core competence for qualified doctors. An effective consultation can facilitate correct diagnosis and improve adherence to management plans [1]. Conversely, poorly managed interactions are associated with poorer outcomes [2] and decreased patient satisfaction [3,4].

Various models exist to transform the art of the consultation into guidance for doctors-in-training. Of these, the Calgary-Cambridge Guide is the most widely used in undergraduate medical education in the UK [5,6]. This, and other models, distil components of a good consulting into frameworks useful for teaching. The Calgary Cambridge Guide has been shown to improve patient centredness, and can be used to assess the development of such in practitioners [7–9].

Criticisms of traditional consultation skills models include that they can be too prescriptive [10] and that models can be a challenge to apply in real clinical settings [11]. Although having a structure can facilitate students' learning, a strict adherence to a linear model can result in an apparent 'tick-box' consultation rather than one that focuses on the patient's needs or the

* Corresponding author.

E-mail address: trevor.thompson@bris.ac.uk (T. Thompson).

development of the student's professional identity [12–14]. Another issue is that most consultation models are designed for general practice, while medical students are predominately placed in secondary care [12,15,16]. The traditional association of general practice with consultation skills teaching can lead to a lack of buy-in around consultation skills from secondary care facilitators. This can inhibit the consistent, integrated and longitudinal input necessary for the consolidation of these complex skills [16,17].

Teaching on the consultation, like in any branch of medical education, should evolve, so that doctors are equipped to consult in the 21st century. Like the Calgary-Cambridge Guide, the UK Council for Clinical Communication (UKCCC) emphasises that patient-centred care and shared decision making, remain at the core of clinical consultations [4]. In the recent UKCCC consensus statement, there was a recognition of a trend towards digitalised medicine, explicit clinical reasoning, health promotion and preventative approaches [4]. The digitalisation of medicine has implications for clinical communication skills, both in terms of patient prior knowledge and appropriate integration of resources within the consultation. This need for flexibility is highlighted by the current Covid 19 pandemic which has led to a much higher proportion of consultations occurring via telephony and over the internet [18].

In this paper we would like to share a new resource for teaching consultation skills. Building directly on UKCCC recommendations, this has been designed to have a strong visual architecture suitable for a web-based delivery platform. We sought a greater emphasis on values, explicit clinical reasoning, patient-activation of self-care and reflection on student learning from the interaction. COGConnect provides the structure of an undergraduate course in effective consulting in the University of Bristol. Designed and delivered by both primary and secondary care physicians, this frustrates traditional silos and includes the new elements we considered essential.

2. Discussion

2.1. Creating COGConnect

From 2016 Bristol Medical School instigated a substantive redesign of its medical curriculum. In this we took a fresh look at how consultation skills might be taught across all five years. In line with the UKCCC [4], we sought to unify learning in clinical reasoning, clinical communication and clinical examination through a helical theme called "Effective Consulting" (EC). A helical theme is a conceptual structure that facilitates a strand of learning, at increasing levels of complexity, as a learner progresses through the stages of a curriculum.

Amid the noise of a busy curriculum, EC needed a strong visual presence to communicate its values and content – a motif that was easily remembered but from which we could hang a rich tapestry of learning. The motif would need face validity for staff, picking it up without much formal training and, with students increasingly accustomed to technologically enhanced learning [19], it would need to seed an online learning structure. This has become an increasing priority with Covid-related restrictions on classroom teaching [18].

We were unable to find an adequate visual fit from models available in our review of the contemporary literature. We sought an image overtly non-linear, iterative, relational and colourful that did justice to the complexity of the consulting process with the patient (literally) at the centre. The models we explored viewed the consultation progressing linearly with the patient visually absent.

To develop our motif, we hosted a seminar with a graphic designer, health psychologist, a range of clinicians and a consultation skills expert, Professor David Pendleton. Through this group the metaphor of the "cog" emerged – a relational object, via which one part of a system connects with and drives another.

From this seed idea we worked with a team of graphic designers and evolved the cog motif into the image below.

2.2. General features

The logo and strapline (top left of Fig.1) define COGConnect at the highest conceptual level as a tripartite invitation to develop cognition (head), communication (heart) and clinical skills (hands). All three of these domains are axiomatic to good medical practice and essential in the UK General Medical Council's (GMC's) duties of a doctor [20]. Where astute thinking and human kindness guide skilful action, we can expect the best outcomes. By making this explicit, COGConnect permits students to consider their well-rounded development as practitioners.

The central image of COGConnect is two persons in connection with the floating cogs suggesting an encounter of different agents who must adapt their cog-connection in terms of speed, direction and dimension. "Have we promoted skills at the expense of values, attitudes and intentions?", asks Silverman in his paper of 2007 [21]. We have responded to this concern by surrounding COGConnect's central image with a set of aspirational practitioner qualities or virtues. Virtues are hard to "teach" but easy to name and this naming conveys to the learner that their teachers and institution value these attributes. They are referred to as the "Five Cs" and are sequenced to reflect the consultation process. They are listed in Table 1 with indicative references.

COGConnect is *process-driven*, guiding the learner through a series of phases, represented in ten colourful cogs. Consultations tend to flow in this sequence but the small arrows of COGConnect indicate bi-directionality – for instance cognitive processing during "formulating" can often trigger a return to further "gathering". The image is also cyclical, in that closing flows through integrating, toward preparing for the next encounter; reflecting that individual consultations sit as part of a chain of care.

2.3. Phases of COGConnect

COGConnect phases are conceived as teaching bookmarks, not firm entities present in every real-world consultation – more *toolkit* than *model*. The online version of COGConnect, (www.cogconnect.info) contains bespoke videos which exemplify best practice in each of the phases. Many of COGConnect's intended learning outcomes (ILOs) will be familiar to all consultation skills trainers whilst some are new, reflecting contemporary priorities. The ten phases are described briefly as follows.

2.3.1. Preparing

The learning objectives in this phase concern what the practitioner does before direct patient contact. The phase is summarised in the catch-phrase "Self, Space, Story, Glory!" (see Table 2)

2.3.2. Opening

This phase focuses on the opening minutes of the consultation and includes generating rapport, general observation, introductory statements, and understanding the patient's (and practitioner's) agenda. For medical students, we also encourage "gestures of care" such as "is there anything I can do to help you feel comfortable before we begin?".

2.3.3. Gathering

We train students to "gather" in three interwoven areas. Firstly to "understand the biomedical presentation" through a focused medical history and examination. Then to understand the patient's perspective on the current situation under the lengthened acronym ICE-IE (see Table 3) and thirdly to explore, in a way appropriate to the context, the patient's "Lifeworld" [27]. This

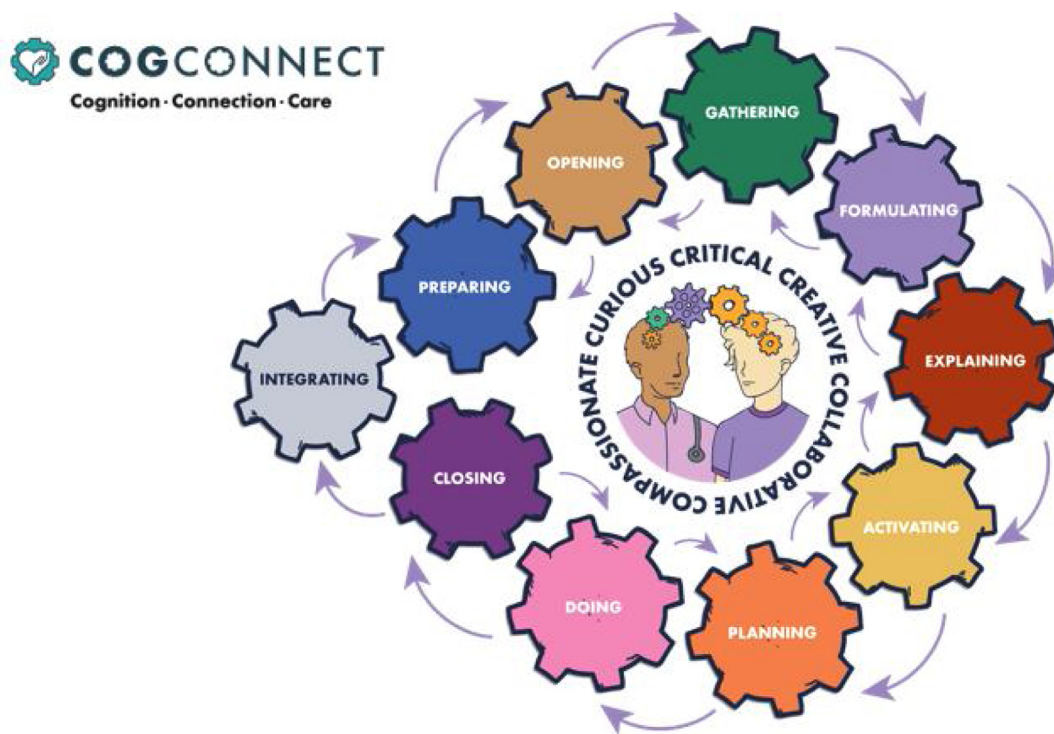


Fig. 1. CogConnect. A video explaining the development and basic features of COGConnect can be viewed at www.COGConnect.info.

Table 1
The “Five C’s” - virtues underlying COGConnect.

Compassionate – approaching clinical situations, colleagues and self, with kindness [22]
Curious – keen to discover the intricacies of ill health [23]
Critical – avoiding diagnostic bias and being discerning in the use of tests and treatments [24]
Creative – willing to find new answers to old problems [25]
Collaborative – ready to work alongside patients, carers and colleagues [26]

Table 2
Preparing Phase - “Self, Space, Story, Glory!” mnemonic (courtesy Dr Ashish Bhatia).

Self – connect to sense of compassion and curiosity. Hydrate, visit the bathroom. Clear any emotional debris from previous encounters.
Space – attend to chair positions, lighting, heating. In a ward environment consider privacy issues.
Story – read up on latest consults, problem list, current meds, investigations and recent correspondence. Speak to nursing and medical staff.
Glory – prepare to give this encounter your best shot and perhaps make a difference for your patient whilst learning.

Table 3
The ICE-IE Acronym.

I – ideas about the problem including on causes and diagnoses
C – concerns about the nature of the problem and its implications
E – expectations regarding how this consultation might address concerns
I – impact of the problem on daily life
E – emotional reaction to the problem

includes their family, social and work-life situations and areas such as diet, physical activity, drugs and alcohol and sleep. For the latter we use the phrase “Lifestyle History” [28].

2.3.4. Formulating

Set between gathering and explaining, formulating is an invitation to pause the cognitive train and think about what is

going on. We draw on clinical decision-making models and reflective frameworks [29,30] to teach formulating under the rubric “STOP4-What?” (see Table 4). This phase explicitly embeds the cognitive processes of clinical reasoning within the actual consultation [31].

2.3.5. Explaining

Good explanations are essential, particularly as over half of the population have a limited health literacy [32]. We teach using the rubric “Check, Chunk, Check” [33] as per Table 5. This adds an initial “check” to the common exhortation to “chunk and check” [34], a practice that can be traced to oncology literature on “breaking bad news” [35].

2.3.6. Activating

COGConnect sees every encounter as an opportunity to promote self-care – as outlined in Outcome 14 m of the UK GMC’s

Table 4
STOP4What? clinical reasoning teaching mnemonic.

STOP4What?

STOP! Self-consciously pause in the consultation, allowing yourself a moment to consider.

What? Mental summary of history, observations and examination findings.

So What? Exclude red flags. Consider aetiologies: predisposing, precipitating and perpetuating causes. Differential diagnoses and/or salient problems.

What Else? Actively thinking of alternate diagnoses and more nuanced problems (based on an understanding of common biases)

What Next? Judicious consideration of possible tests, treatments, referrals and human factors.

Table 5
Check Chunk Check rubric for explaining.

Check: patient's current understanding, patient's desire to know more and likely cognitive capacity, calibrating for age, linguistic skills etc. Practitioner checks own understanding.

Chunk: deliver information in appropriately sized packages, with pause for micro-checks, avoiding technical language, and using visual aids and metaphors as appropriate.

Check: put emphasis on explainer – e.g. “please mention anything I could have explained more clearly.” Consider requesting “playback” from patient. Seek out specific concerns in relation to ICE-IE.

“Outcomes for Graduates” [31,36]. Students can usefully engage with patients in areas like healthy eating, exercise and sleep, in the role of guide or coach [37].

2.3.7. Planning

This is the phase where clinicians and patients decide what should happen next, and how we share those decisions in line the patients' ideas, concerns and expectations, using established models of shared decision making, e.g. [38].

2.3.8. Doing

This phase was incorporated following discussion with secondary care colleagues. This phase reflects consultations in primary and secondary care where procedures are a key feature. Learning objectives in this phase centre on consent, patient safety and clinical competence.

2.3.9. Closing

This phase includes skills in creating a concise summary, offering the patient the chance to ask for clarifications and potentially checking understanding through questioning or playback. Here sit the skills of “safety-netting” [39], arranging follow-up, clarifying “what's next” and ending on an encouraging note.

2.3.10. Integrating

This relates to actions outside the face to face encounter such as making an accurate clinical record, recording and actioning practitioner educational needs arising from the consultation, making referrals, marking the consultation for discussion later with colleagues, and attending to emotional self-care [40]. It provides a location for the sort of clinical supervision currently underrepresented in medicine [41]. We also teach “integration” as a feature of *patient* experience, making sense of the consultation experience and its implications.

Table 6
How “Effective Consulting” training is structured at Bristol Medical School, University of Bristol, UK.

Students have ~20 half days of Effective Consulting (EC) spread across their first two years. Half of these are campus-based and focus on communication skills, with clinical facilitators, peer feedback and simulated patients. The remainder are delivered across primary and secondary care with a focus on observing real consultations, meeting expert patients, and practicing clinical and communication skills. Additionally, second years undertake a 2 week EC “clerkship” in ward-based learning, using COGConnect for clerking consultations and peer observation. In these ways we are frustrating the traditional primary and secondary care divisions. We are currently developing new material for the later clinical years.

2.4. COGConnect in practice

COGConnect is the fulcrum around which we have designed a novel consultation skills training course, within a new curriculum initiated in 2016. This training integrates learning in three domains: clinical reasoning, clinical communication and clinical skills, and is badged as “Effective Consulting”. As well as developing the generic skills of active listening, students begin their training in clinical examination and in managing the complexity of simulated consultations with actors. See Table 6.

Early sessions focus on individual phases of COGConnect. This atomisation allows students to lay their attention on specific skill sets such as “explaining” or “activating” with COGConnect providing the over-arching map of the territory. As students progress, they start to practice whole consultations, drawing on different elements of COGConnect as dictated by the clinical context.

We have developed a guide (CC–COG) for observing consultations based on the phases of COGConnect. CC–COG sits on a single side of A4 and prompts the observer to make written comment on the consultation as it unfolds. It can be used “live” or with pre-recorded consultation videos. The consulter can even be scored, OSCE-style, for their performance in each phase. It has been used by students when observing practitioners and by students consulting in pairs.

CC–COG also helps learners notice what did not happen – e.g. where an opportunity to explain or activate was present but not taken up. CC–COG foregrounds generic consultation skills such as the use of open questions, reflections and more abstract abilities like conveying confidence and hope.

2.5. Evaluating COGConnect

Evaluation of COGConnect has been formative to date – conducted to improve the intervention rather than to prove its

worth to an external readership. The new curriculum is not fully implemented until 2021 and we risk a “Type III error” by formally evaluating too soon [42]. We have sought regular feedback from stakeholders over the past 3 years including:

- Students (currently years 1–4 of 5)
- Medical School Faculty
- Clinical communication tutors
- Clinical teaching fellows
- Simulated patients
- General practitioners
- Secondary care clinicians
- Expert external and internal consultants

Simulated patients work across both the new and existing MBChB courses. They have extensive experience facilitating communication skills teaching using both Calgary-Cambridge and COGConnect and so have been a useful barometer of change. They report favourably on COGConnect and have commented on the holistic, patient centred nature of students who have been trained using it:

“These first years are consulting at the level of current 3rd years. The students seemed genuinely interested in listening to the patient and involving them”. Simulated patient comment.

We are attuned the possibility of confirmation bias in this sort of feedback. Informal instrumental evaluation, through stakeholder feedback, has enabled us to evolve COGConnect, for example adding the ‘Doing’ phase in response to calls from secondary care colleagues. With the basic structure of COGConnect settled, our main development focus is on the website – work on which has been delayed by the Covid19 pandemic. This will involve us in further rounds of stakeholder consultation.

We need to identify what and how we will formally evaluate, for example using the RUFDATA approach [43,44]. Our evaluations will need to acknowledge that COGConnect is embedded within a new delivery method, within a new curriculum, and delivered for many during a pandemic.

Our plans include:

- 1 Evaluating face validity of COGConnect in primary and secondary care settings, where, inspired by Silverman, we have sought to integrate COGConnect [12].
- 2 Evaluating reliability of CC–COG as a method for peer and tutor assessment of student consultation skills
- 3 Evaluating the experience of both simulated patients and ‘real world’ patients interviewed by students using the COGConnect using existing validated instruments [45].
- 4 Formal student evaluation through focus groups
- 5 Formal student evaluation through existing assessment processes
- 6 Evaluating the implementation of COGConnect in different clinical settings such as postgraduate training and various secondary care specialties.

The validity of any formal assessment of COGConnect would be enhanced by its application in other institutions and educationalists are warmly invited to contact us with a view to collaborative research. The validity of COGConnect *in particular* builds on the substantive body of work on the validity of consultation models *in general*. Our intention then would be to focus our evaluation on novel features of the toolkit.

3. Conclusion

Consultation skills are vital in medical practice and can be taught [46]. Most real-world consultations are complex, and we

hope to prepare students to face that complexity with confidence by using COGConnect. COGConnect was developed with close attention to the existing literature and launched in the context of a new curriculum in a long-established medical school. It was designed to build on the strengths of existing frameworks, such as the Calgary Cambridge Guide (CCG), with which many readers will be content and familiar. COGConnect has some conceptually distinctive features that we considered essential for teaching consultation skills in 21st century medicine.

Its main motif has practitioner and patient at the centre, where the modern patient expects to find themselves [47]. Its central metaphor is the “cog”. In mechanics, cogs connect and transmit energy. COGConnect encourages students to create that sort of snug engagement by adjusting their actions to the wide-ranging diversity with which patients present (illustrated by the multiple cogs in the central image).

With its tag line of “Cognition. Connection. Care.”, COGConnect reminds learners and teachers that consulting is a whole-person commitment of head, heart and hand. By explicating “formulating” as a distinct consultational phase COGConnect enhances diagnostic thinking and challenges unconscious bias [48,49]. The metaphor of “heart” again champions the relational, with emotional intelligence increasingly recognised as a vital component of safe and effective care (for instance through its impact on healthy team behaviour) [50]. COGConnect also maps (through the phase of “doing”) the many practical and procedural competencies which a student must address – it is not limited to “communication skills”.

COGConnect favours the circular over the linear. A linear model is out of step with other natural systems where the products of one iteration always form the substrate for another [51]. The design is consciously visual, iterative, bi-directional and multi-phasic. Among these phases are important additions that chime with the most recent recommendations of the UKCCC [4]. For instance, with “Gathering” we have expanded the conventional notion of social history to include assessment of a patient’s “Lifeworld” [27] and “Lifestyle History” [28]. “Activating” provides a context for empowering self-care [52]. “Integrating” acknowledges all the house-keeping tasks that make practice safe and sustainable [40].

Some users might view COGConnect as too complex. The phrase, attributed to Einstein, that things should be made “as simple as possible but not simpler” applies to something as nuanced as the consultation. There is no phase of COGConnect we could delete without removing something vital to a significant proportion of well-conducted consults. We have wondered if, like with the ECG, complexity reduces with familiarity.

A danger with any process-driven model is that it breaks down into parts something that, in practice, appears to function as a seamless whole. The student starts to follow the model instead of their own intuitions or, worse, worry about not following it. Our response to this risk is to present COGConnect not as a model but as a toolkit, a sequenced collection of techniques that may provide answers in particular situations. Something to use, not something to follow.

Though we use COGConnect as a static visual, we have acknowledged the modern learner’s expectation for video, interactivity and the option of self-directed exploration on computer and smartphone [19]. Our evolving website, cogconnect.info, is smartphone enabled and includes links to our suite of video training resources which we offer freely to the educational community. We are working on deepening our resources in relation to specific phases, with particular focus on “lifestyle conversations”.

COGConnect is now the *de facto* consultation toolkit for our institution but is still in development, especially in its digital format at www.COGConnect.info. It needs formal evaluation to discern its place in the wider consultation training community. We

are keen to forge research collaborations for those who see the potential of this visual resource, focused on the needs of 21st century patients and their practitioners.

3.1. Practice implications

- 1 COGConnect provides a visual resource that maps familiar phases of the consultation (such as “opening”, “explaining” and “closing”) and introduces new elements (such as “formulating”, “activating” and “integrating”) that we consider essential for 21st century practice. There is a trend to help students understand how to think diagnostically and to avoid cognitive bias. COGConnect makes “formulating” a specific phase of the consultation and institutes a discipline of reflective thought around both diagnoses and problems.
- 2 The need to engage patients in conversations about lifestyle is considered a core part of modern practice, as evidenced by clinical and GMC guidelines [20]. This is woven into the COGConnect phase of “activating”.
- 3 Practitioner self-care has been under-emphasised in the teaching of consultation skills and again this is a firm trend in modern medical education and part of the “integrating” phase of COGConnect.
- 4 Video is a strong medium with which to explain and explore consultation skills. The on-line version of COGConnect is enabled for computer or smartphone and links to video material specific to each of the phases. Later iterations will be designed for self-directed learning.
- 5 By specifically stating that good consulting is a blend of head, heart and hand, COGConnect seeks to champion the creation of well-rounded practitioners i.e. those who can think clearly, connect warmly and act skilfully.
- 6 By surrounding the central image of COGConnect with a statement of core consultational values, such as compassion and collaboration, we remind students and faculty of higher level aspirations in medical consulting.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

"I confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story."

Declaration of Competing Interest

The authors declare that there are no conflicts of interest.

Acknowledgements

The authors would like to acknowledge the participants of the development focus group, Dr Ashish Bhatia for gifting the “Self, Space, Story, Glory” acronym, tutors and students of the Bristol Medical School “Effective Consulting Course” for their constructive feedback, Dominic Alder for help with www.cogconnect.info, Dr James Brennan for feedback on the manuscript and Dr Damian Kenny for work on “CC–COG”.

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