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# BMJ Open Conceptualising Centres of Clinical Excellence: A Scoping Review

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## ABSTRACT

**Objectives** Centres of clinical excellence (CoCE) are healthcare facilities that provide excellent healthcare. However, despite their increasing prevalence, it is unclear how CoCE are identified and monitored. This paper explores how CoCE has been described in the literature, including its defining characteristics and selection and monitoring processes.

**Design** We conducted a scoping review following Arksey and O'Malley's framework, enhanced by Levac *et al*. Additionally, we adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guidelines.

**Data sources** A comprehensive search using MEDLINE Ovid, PubMed, Web of Science, CINAHL and Scopus was conducted to identify relevant literature from January 2010 to June 2022.

**Eligibility criteria for selecting studies** We included published studies and grey literature that described how a CoCE was defined, established, monitored or evaluated.

**Data extraction and synthesis** Two independent reviewers completed the title and abstract screening, reviewed the full texts and extracted data.

**Results** 50 records describing 45 initiatives were included. More than half were published in the USA (n=25, 56%). All but one initiative focused on one clinical condition/population, most commonly cardiovascular disease (n=8, 17%), spinal surgeries (n=4, 9%) and pituitary tumours (n=4, 9%). Most initiatives (n=30, 67%) described a structured process to establish CoCE. The definitions of CoCE were not uniform. Common defining features included the volume of patients treated, medical expertise, a highly skilled multidisciplinary team, high-quality care and excellent patient outcomes. Identification as a CoCE varied from self-identification with no explicit criteria to application and assessment by an approval panel.

**Conclusion** Despite a growing prevalence of CoCE, there are inconsistencies in how CoCE are established, identified, monitored and evaluated. Common (but not uniform) features of CoCE are highly skilled staff, high-quality care delivery and optimal patient outcomes.

## INTRODUCTION

Healthcare facilities worldwide have a shared goal to continually improve healthcare delivery, often using stringent standards and indicators.<sup>1 2</sup> Improvements in healthcare delivery can take the form of defining best

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The study used inclusive search strategies (peer-reviewed journals and grey literature) and a stringent review process using two independent reviewers throughout the process.
- ⇒ The study used Arksey and O'Malley's framework with enhancement from Levac *et al* and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guidelines.
- ⇒ We may have missed established centres of clinical excellence that have not published any studies or reports or published in non-indexed sources.

clinical practice or demonstrating important aspects of care, such as safety, access, affordability, equity, effectiveness and efficiency.

Most healthcare organisations must meet national quality and safety standards to address clinical practice and organisational performance.<sup>1</sup> Accreditation is instrumental in achieving a baseline standard of care; however, it is not usually designed to recognise excellent care or to optimise patient-reported outcomes and experience. Recognising this gap between care that meets accreditation standards and 'excellent' care, some healthcare facilities are taking proactive steps to engage in self-improvement and seek recognition for delivering exceptional care.

Excellence within healthcare is often labelled 'clinical excellence',<sup>3</sup> and organisations that deliver exceptional patient care have been called centres of excellence or centres of clinical excellence (CoCE).<sup>4-6</sup> Other dimensions of excellence that have been described in healthcare include 'research excellence',<sup>7</sup> 'service excellence'<sup>8</sup> and 'operational excellence'.<sup>9</sup> A recently published review<sup>6</sup> summarised evidence pertaining to centres of excellence in healthcare, education, research, industry and information technology. The authors of this review concluded that there are inconsistencies in how healthcare facilities are designated as centres of excellence and ambiguity between

centres of excellence and regular healthcare facilities, with limited information on how these centres were evaluated. Similarly, research excellence has been reviewed from education and clinical research perspectives, and frameworks are frequently not comprehensive,<sup>6</sup> with unclear methods used to determine excellence.

Attaining recognition as a CoCE could be a source of inspiration to facilities that are recognised as leads in healthcare provision.<sup>10</sup> Health professionals within the facilities can be inspired to pursue and maintain the best clinical care for their patients by promoting high-quality, up-to-date, evidence-based care to their community.<sup>10</sup> Additionally, CoCE can work with accreditation bodies to set higher benchmarks that encourage innovative patient-centred care. Accreditation bodies can adopt and maintain advanced standards of care over time, helping healthcare centres to continually raise the standards of patient outcomes.<sup>11</sup>

Despite the increasing use of the term CoCE, there is a lack of clarity about how this term is defined, how sites are nominated and selected as CoCE and how CoCE are evaluated and monitored. Therefore, the primary aim of this scoping review was to map evidence on CoCE in healthcare. We sought to explore and answer the following questions systematically:

1. What CoCE have been described in the literature?
2. What are the defining characteristics of CoCE?
3. How are CoCE selected or nominated?
4. What monitoring processes are employed to remain as CoCE?

Through conducting this review, we planned to explore the multifaceted dimensions of CoCE.

## METHOD

### Protocol and registration

We registered the scoping review protocol on Open Science Framework. We employed the scoping review framework proposed by Arksey and O'Malley<sup>12</sup> with the refinement outlined by Levac *et al*<sup>13</sup> to evaluate the evidence on CoCE. We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews.<sup>14</sup>

### Identifying relevant studies

We developed a search strategy with the support of a research librarian (online supplemental file 1). We searched MEDLINE Ovid, PubMed, Web of Science, CINAHL and Scopus to identify published records between January 2010 and June 2022. We also searched for grey literature (government reports, policies, protocols, conference proceedings and unpublished studies) and relevant websites using Google and Google Scholar. We also searched the reference lists of included records to check for further relevant records.

Inclusion and exclusion criteria are presented in **box 1**. We included records that discussed CoCE that provided clinical care for people with any health condition in any

## Box 1 Eligibility criteria for article selection

### Inclusion criteria

- ⇒ Available in the English language.
- ⇒ Information on CoCE.
- ⇒ Healthcare organisations or services providing clinical care to people with any healthcare condition.
- ⇒ Published from January 2010.
- ⇒ Any geographical location.
- ⇒ Studies describing the development/defining/monitoring/evaluation/frameworks of CoCE.

### Exclusion criteria

- ⇒ Records that describe a study conducted at CoCE (eg, using participants from CoCE).
- ⇒ Centres that do not provide clinical care (eg, Centres of Research Excellence or Centres of Leadership Excellence).
- ⇒ Conference abstracts/papers, letters, NICE guidelines, JBI guidelines.
- ⇒ Only looking at costs associated with one CoCE (no comparator).
- ⇒ Only looking at clinical outcomes for people receiving care at CoCE (no comparator).
- ⇒ Using the term 'CoCE' without outlining the criteria.

CoCE, centres of clinical excellence; JBI, Joanna Briggs Institute; NICE, National Institute for Health and Care Excellence.

setting (primary care, inpatient, outpatient or community). To be included, records had to describe how a CoCE was defined, established, monitored or evaluated. We excluded records that used the term 'CoCE' without outlining any criteria. Centres of excellence that were not designed to provide clinical care (such as centres of research excellence) were excluded. Given the exploratory nature of the research questions, there was no limitation to study populations or interventions.

### Study selection

The search results were imported into Covidence, and duplicates were removed. As recommended by Levac *et al*,<sup>13</sup> two reviewers independently screened titles and abstracts and reviewed full-text documents using the inclusion criteria (see **box 1**). One reviewer (TK) conducted the online search for relevant websites (first 20 pages on Google search) and two reviewers (TK and LNB) independently completed the screening and review of the grey literature. The inclusion and exclusion criteria were reviewed periodically throughout the title and abstract screening process to ensure the criteria facilitated the identification and inclusion of relevant studies.

### Charting the data

A data extraction form was developed for the study (online supplemental tables 1 and 2). We pilot-tested the extraction form with the first 15 eligible records to ensure consistent data collection. Two reviewers (TK and EAL) independently extracted data on all included studies using the extraction form on Covidence. The quality of individual records was not assessed due to the descriptive nature of the review aims.

## Collating, summarising and reporting the results

We synthesised the research findings according to the research questions and presented data from all included studies in tables. Study characteristics were presented descriptively, and the research questions were presented narratively. Henceforth, the CoCE will be identified as initiatives and the search results will be defined as records. Each initiative will be described either as a theoretical centre (describing aspirational criteria/frameworks to develop a CoCE) or a physical centre where clinical care is provided. Initiatives that described a framework were classified as ‘creating’ a framework, ‘using’ or ‘adapting’ a pre-existing framework.

## Patient and public involvement

Patients were not involved in the design or completion of this study.

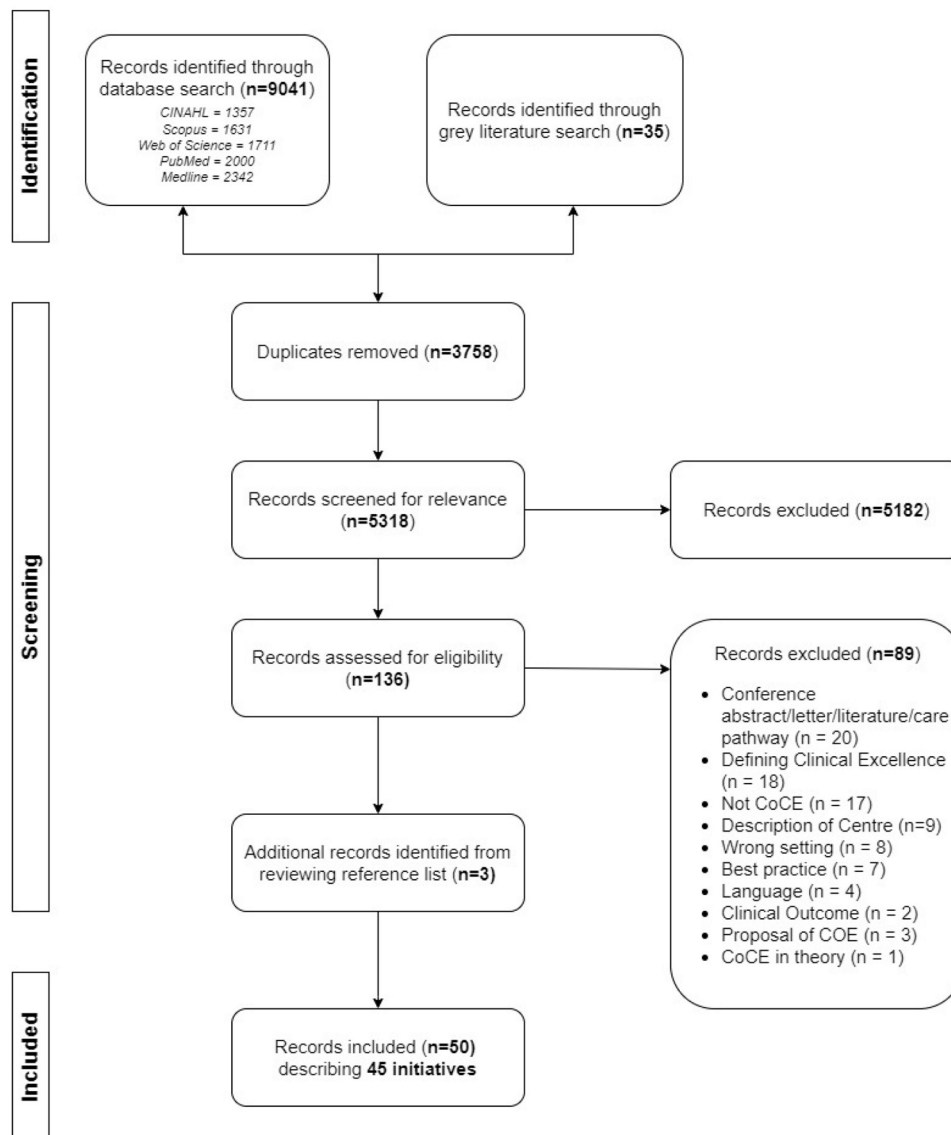
## RESULTS

### Selection of sources of evidence

Overall, 9077 records were identified from a database search, and 36 records were identified through a grey literature search. A further three records were identified by reviewing reference lists of included records. 50 records describing 45 CoCE initiatives were included in the analysis (figure 1). The complete search results and strategies are available in online supplemental file 1. Among the records excluded at full-text review, 25 (n=28%) records described or labelled a centre as a CoCE but did not provide any selection criteria or any details about how the centres were nominated or monitored.

### Characteristics of sources of evidence

Most records (n=43, 86%) were published in or after 2015. Nearly all the included records (n=44, 88%) were published in peer-reviewed journals, but only 15 (30%) were research articles, the remaining 28 (56%) records



**Figure 1** PRISMA flow diagram. CoCE, centres of clinical excellence; COE, centre of excellence; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

**Table 1** Characteristics of included records

	N (%)
Types of literature from included records (n=50)	
Research articles	15 (30)
Others (editorial, reports, case reports) from peer-reviewed journals	28 (56)
Book chapters	3 (6)
Websites	2 (4)
Systematic review	1 (2)
Government report	1 (2)
Country of Centre or initiatives described (n=45)	
USA	25 (56)
Others	20 (44)
Clinical conditions from initiatives described (n=45)	
Cardiovascular disease	8 (18)
Spinal surgery	4 (9)
Pituitary tumours	4 (9)
Diabetes	3 (7)
Pregnancy related	2 (4)
Others	24 (53)

were other article types such as editorials or case reports. Two websites were identified as additional records for initiatives identified through the literature search (see tables 1 and 2).

### Synthesis of results

Less than half (n=20, 47%) of the identified initiatives were physical CoCE. With the exception of one CoCE which provided care for people with diabetes and cardiovascular disease,<sup>15</sup> all identified CoCE treated a single clinical condition or population. The most commonly described conditions were cardiovascular disease<sup>16–23</sup> (n=8, 17%), spinal surgeries<sup>24–27</sup> (n=4, 9%), pituitary tumours<sup>28–31</sup> (n=4, 9%), diabetes<sup>15 32 33</sup> (n=3, 6%) and obstetrics<sup>34 35</sup> (n=2, 4%).

Some CoCE (n=6, 13%) were located across several countries,<sup>17 21 25 28 36 37</sup> whereas the majority were described as stand-alone clinical centres, such as wards, surgical centres or clinics. Eight CoCE (18%) were located in low-income and middle-income countries.<sup>20 32 38–43</sup> More than half of the included CoCE were located in the USA (n=25, 53%). CoCE established in high-income countries were typically described in terms of high quality of care delivery, such as standardised care and optimal outcome (n=12, 27%),<sup>19 21–23 25 33 35 38 39 44–46</sup> comprehensive multidisciplinary care (n=8, 18%)<sup>16 28 31 32 40 47–49</sup> or accessible patient-centred care (n=7, 16%).<sup>4 15 29 36 42 50–52</sup>

More than half of the initiatives (n=30, 67%) described a structured process to establish a CoCE. While many initiatives reported that the CoCE was established using a framework or series of developmental stages, details regarding the developmental stages were rarely available.

Five initiatives were reported using published frameworks (Elrod and Fortenberry,<sup>29 37 45</sup> Christmas<sup>53</sup> and National Cancer Institute<sup>23</sup>) to guide their process to establish the CoCE (see table 2 for further details).

### Defining characteristics of CoCE

Less than half (n=19, 42%) of the initiatives explicitly defined the characteristics of the CoCE. Seven (16%) initiatives<sup>20 24 26 29 37 45 54</sup> used the definition from Elrod and Fortenberry<sup>4</sup>: ‘a programme within a healthcare institution which is assembled to supply an exceptionally high concentration of expertise and related resource centred on a particular area of medicine, delivering associated care in a comprehensive, interdisciplinary fashion to afford the best patient outcomes possible’ (p.16).<sup>4</sup>

High volumes of patients treated or numbers of procedures performed, staffing, infrastructure, high quality of care and above-average patient outcomes were the most commonly described defining features of CoCE. Staffing components included medical expertise, highly skilled multidisciplinary teams and staff-to-patient ratios. Other resources that were described as part of the CoCEs were infrastructure (n=15, 33%), such as building space and examination rooms and specialised equipment (n=9, 20%). High quality of care delivery was described in terms of standardised care and optimal outcome (n=12, 27%),<sup>19 21–23 25 33 35 38 39 44–46</sup> comprehensive multidisciplinary care (n=8, 18%)<sup>16 28 31 32 40 47–49</sup> or accessible patient-centred care (n=7, 16%).<sup>4 15 29 36 42 50 51</sup> The availability of treatment protocols was described as an important feature in seven initiatives (15%) (see table 2 for details).

There were differences noted in the defining characteristics of CoCE in low-income, middle-income and high-income countries. Universally, most CoCE had common features regarding staff expertise, equipment and patient outcomes. However, CoCE in low-income and middle-income countries tended to provide a healthcare service that otherwise was not available in the region, for instance, neurosurgery in Peru<sup>39</sup> and comprehensive dental care in Guwahati, India.<sup>38</sup>

### Selection or nomination process of CoCE

No details were available about how sites were selected as CoCE in half (n=24, 53%) of the included initiatives. While 21 initiatives reported that there was a selection or nomination process to be recognised as a CoCE, the details of the selection or nomination process were inconsistently reported. When reported, processes used to select centres as CoCE were varied and included application and assessment by an approval panel (n=9, 45%),<sup>4 8 23 34 43 45 54–56</sup> self-identification as a CoCE with no explicit criteria or external assessment (n=6, 30%)<sup>15 16 19 29 41 50</sup> and site visit by funding body to assess suitability (n=1, 5%).<sup>18</sup> Only four (20%)<sup>36 46 48 57</sup> initiatives presented the process used to select the CoCE in its entirety, which are presented in table 3. The bodies

**Table 2** Characteristics of CoCE initiatives

First author of main record describing initiative	Theoretical centre (T) or physical centre (P)	Resources			Processes used or suggested for CoCE			
		Framework adapted/created	Personnel	Infrastructure	Equipment	Criteria described	Processes to establish a CoCE	Processes to monitor a CoCE
Bitzer <i>et al</i> <sup>47</sup>	T	X	X	X		X		X
Burkett <i>et al</i> <sup>24</sup>	T		X			X		X
Campbell <i>et al</i> <sup>38</sup>	P	X	X	X		X		
Carvalho and Jill <sup>34</sup>	T	X	X		X	X		X
Casanueva <i>et al</i> <sup>28</sup> & Tritos <sup>31</sup>	T	X	X			X		
Chang <i>et al</i> <sup>48</sup> & Lymphatic Education & Research Network <sup>68</sup>	P	X	X			X		X
Choque-Velasquez <i>et al</i> <sup>39</sup>	P		X		X			X
Coon <i>et al</i> <sup>69</sup>	P	X	X			X		
Creehan <i>et al</i> <sup>70</sup>	T	X	X			X		
Daming <i>et al</i> <sup>19</sup>	P	X	X	X		X		X
Deshmukh <i>et al</i> <sup>40</sup>	P	X	X			X		X
Dietz <i>et al</i> <sup>44</sup>	T	X	X		X	X		
Distiller and Brown <sup>32</sup>	P		X			X		X
Draznin <i>et al</i> <sup>33</sup>	T	X	X	X		X		
El-Eshmawi <i>et al</i> <sup>16</sup>	P	X	X	X		X		X
Elrod and Fortenberry <sup>4</sup>	P	X	X	X		X		X
Ferguson and Froehlich <sup>50</sup>	P		X			X		X
Frara <i>et al</i> <sup>29</sup>	T	X	X	X		X		X
Geetha <i>et al</i> <sup>53</sup>	P	X				X		
Haider <i>et al</i> <sup>37</sup>	T	X	X			X		X
King, Jamieson and Berg <sup>45</sup>	P	X				X		X
Kullar <i>et al</i> <sup>54</sup>	P	X	X			X		X
Lancellotti <i>et al</i> <sup>17</sup> & Chambers <i>et al</i> <sup>18</sup>	T		X			X		X
Li <i>et al</i> <sup>55</sup>	T					X		X
Marinoff and Heiberger <sup>41</sup>	P		X			X		X
Martin <i>et al</i> <sup>25</sup>	T	X				X		
McLaughlin <i>et al</i> <sup>80</sup>	T		X		X	X		X
Nakov <i>et al</i> <sup>20</sup>	P		X			X		
Piccini <i>et al</i> <sup>21</sup>	T	X	X	X		X		

Continued

Table 2 Continued

First author of main record describing initiative	Theoretical centre (T) or physical centre (P)	Resources				Processes used or suggested for CoCE		
		Framework adapted/created	Personnel	Infrastructure	Equipment	Criteria described	Processes establish a CoCE	Processes to monitor a CoCE
Pronovost <i>et al</i> <sup>49</sup>	T	X				X		X
Safer Care Victoria <sup>51</sup>	T	X				X		
Sandhu <i>et al</i> <sup>22</sup>	T	X	X					
Santos-Moreno <i>et al</i> <sup>36 71 72</sup>	P	X	X	X	X	X	X	X
Sheha and Iyer <sup>26</sup>	T		X			X		X
Shikora <i>et al</i> <sup>57</sup>	P	X	X	X	X	X	X	X
Shommu <i>et al</i> <sup>73</sup>	T					X		
Silver <i>et al</i> <sup>35</sup>	T		X	X		X		
Steiner <i>et al</i> <sup>56</sup>	T		X			X	X	
Tapela <i>et al</i> <sup>42</sup>	P		X	X	X	X		
Thomas <i>et al</i> <sup>15</sup>	P		X		X	X	X	X
Vivian <i>et al</i> <sup>46</sup>	P	X	X	X	X	X	X	
Williams <sup>23</sup>	T	X	X		X	X	X	
Wirth <i>et al</i> <sup>52</sup>	T	X	X			X	X	X
Wu <i>et al</i> <sup>27</sup>	T	X				X		X
Yao and Zhou <sup>43</sup>	P	X	X			X	X	X
Total	21 (P) 24 (T)	30	37	15	9	39	20	24
CoCE, centres of clinical excellence.								

**Table 3** Outline of selection/nomination process of CoCE

First author	Steps outlined
Chang <i>et al</i> <sup>48</sup> & Lymphatic Education & Research Network <sup>68</sup>	1. Applications will be reviewed by the LE&RN Global Oversight Committee (GOC). All applications will be scored, using the following three individual criteria: <ol style="list-style-type: none"> <li>1. The quality of the overall application/services.</li> <li>2. Unique offerings or particular characteristics that add to the lymphatic disease clinic.</li> <li>3. Miscellaneous (eg, lymphatic disease community citizenship, research).</li> </ol>
Santos-Moreno <i>et al</i> <sup>36</sup>	<ol style="list-style-type: none"> <li>1. Implementing an attention model for the patients diagnosed with rheumatoid arthritis, in accordance with the requirements of each type of centre of excellence.</li> <li>2. Filling the self-assessment form of each type of centre of excellence and implementing improvement actions.</li> <li>3. Requesting and preparing for a verification visit.</li> <li>4. Receiving a verification visit from REAL-PANLAR.</li> <li>5. Official notice of the results of the assistance and verification visit.</li> </ol>
Shikora, Delegge and Van Way III <sup>57</sup>	<ol style="list-style-type: none"> <li>1. Online application completed by surgeon or facility.</li> <li>2. Successful application results in provisional status.</li> <li>3. Within 2 years must seek full approval and pass on-site inspection and indicates has an excellent outcome.</li> <li>4. Mandatory submission of all patient data to a database.</li> </ol>
Vivian <i>et al</i> <sup>46</sup>	<ol style="list-style-type: none"> <li>1. Establishing the foundation (leadership structure and purpose).</li> <li>2. Formalising the centre of excellence programme (clinical education training, multidisciplinary team involvement).</li> <li>3. Solidifying the centre of excellence status (certification/accreditation by external institute).</li> </ol>

CoCE, centres of clinical excellence.

providing oversight of the nomination or selection of the CoCE were professional bodies,<sup>23 26 34 36 48 54</sup> insurers<sup>45 55</sup> and organisations.<sup>4 38 46</sup>

### Monitoring protocols to remain a designated centre of clinical excellence

Only 24 (53%) of the included initiatives reported a monitoring process for the CoCE. Monitoring was mandatory for 6 (25%)<sup>34 36 48 52 54 57</sup> initiatives through recertification process. Other initiatives reported the importance of monitoring outcomes such as productivity (n=5, 21%),<sup>17 19 39 43 50</sup> patient outcomes (n=9, 36%),<sup>15 16 27 29 30 32 45 47 49</sup> quality metrics (n=3, 13%)<sup>24 26 37</sup> and cost-effectiveness of the programme (n=1, 4%),<sup>40</sup> but there was no evidence that this monitoring process was routinely performed or overseen by any parties.

## DISCUSSION

### Summary of evidence

To our knowledge, this is the first scoping review to summarise what is known about CoCE in healthcare.

Despite identifying numerous CoCE initiatives, we were unable to identify selection processes used in more than half of the included initiatives. When selection processes were documented, they varied between initiatives. Further, there were inconsistencies in monitoring CoCE performance. Without consensus on what defines a CoCE, and

without a recognised body to monitor the performance within each CoCE, there is no guarantee that care being delivered by sites claiming to be CoCE are delivering excellent (or even better-than-usual) healthcare.

The most common defining feature of CoCE included in this review was resource availability, specifically personnel, infrastructure and equipment. These findings are not surprising; it is well established that there are associations between staffing levels, skill mix, infrastructure and patient outcomes.<sup>58–62</sup> For example, higher nursing staffing levels and employment of more skilled staff are associated with better patient outcomes such as reduced rates of pressure injuries, mortality and falls.<sup>58 60</sup> Features such as infrastructure and specialised expertise are also key factors in centres of excellence in other industries.<sup>8</sup> The inclusion of these features within CoCE reinforces that the included CoCE were designed to align with what is known about healthcare delivery that leads to improved patient outcomes.

While frameworks or processes used to establish or describe CoCE may be valuable to guide others in the field, they may have limitations if these processes were developed for a specific healthcare facility, stakeholder cohort or disease group. For example, the Willis-Knighton Health System is a not-for-profit healthcare network in Louisiana, USA, that operates 11 self-nominated centres of excellence. The framework used to establish these



centres of excellence was described by Elrod and Fortenberry and cited by authors of 8 initiatives in our review to describe or establish their centres. Consideration should be given as to whether this framework is fit for purpose beyond the state of Louisiana and in countries with different healthcare models from the USA. Additionally, it is unclear whether this framework meets a universally agreed definition of excellence in healthcare. Empirical research to define 'excellent care' from the perspectives of patients, healthcare facilities or funders could increase the validity of the frameworks and, subsequently, the CoCE. A recent study (published after our review was completed) has identified defining criteria of 'aspirational' (vs pragmatic, feasible or cost-effective) CoCE in stroke recovery and rehabilitation from the perspective of healthcare providers, survivors and caregivers and researchers. These criteria and the underpinning indicators could be used by facilities seeking recognition as CoCE in stroke healthcare provision.<sup>63</sup>

Selection procedures for CoCE were inconsistently reported and were unavailable for nearly half the included initiatives. The description of excellent care provided by the CoCE varied, seemingly depending on the agency responsible for defining it. Descriptions of excellence encompassed patient-centric outcomes (eg, optimising clinical outcomes and quality of life), service-centric outcomes (eg, staff skill development, resource availability and meeting quality and safety accreditation) and economic outcomes (eg, cost of treatment and length of stay). The concept of excellence was sometimes conflated with high volume of patients who received care at the centre. Excellence for some centres from low-income and middle-income countries was defined (either by self-nomination or by the government or collaborating international institutions) in providing a particular healthcare service when none was previously available in the region. Many of these aspects of excellence reflect commonly measured quality indicators of healthcare in high-income countries, namely effectiveness, access, safety and efficiency.<sup>64</sup> However, cost is not included as a quality metric in countries such as Australia, Canada or the UK, but it is included as a measure of quality in the US Commonwealth Fund framework.<sup>64</sup> The difference between healthcare systems that generate income and those that do not is likely to influence many aspects of excellence. The inclusion of cost as a feature of some CoCE could be reflective of the different funding models (eg, fee-for-service vs universal healthcare) or healthcare priorities within the centres or by the bodies determining a site's excellence. While cost is considered in universal healthcare funding models, it is rarely highlighted beyond ensuring that healthcare providers function within their budget, which markedly differs from financial models that seek to produce profit in fee-for-service healthcare systems. Indeed, the centres that reported economic outcomes as a measure of clinical excellence were predominantly located in the USA and were nominated by healthcare funders suggesting that cost and cost efficiency is overtly

considered as an important facet of excellence in fee-for-service centres.<sup>65 66</sup>

Benchmarking is a well-recognised process that identifies the best-performing healthcare facilities in terms of patient outcomes and system performance.<sup>67</sup> However, while there is an implicit assumption that CoCE will deliver care that is superior to another (non-excellent) centre, most of the included initiatives in our review did not benchmark with other services. Benchmarking allows tracking of performance over time while comparing performance against other facilities, thereby demonstrating what is feasible to achieve in terms of quality of care.<sup>67</sup> For the initiatives included in this review, without comparison to other healthcare facilities and without a standardised set of explicit, evidence-based and measurable criteria, it raises disparity and challenges on how these centres can claim to be legitimate CoCE.

It is recognised that healthcare performance can be variable,<sup>67</sup> so healthcare facilities should monitor and evaluate their programmes to ensure continued excellence. This process needs to be feasible within the time and resource constraints. Just over half the initiatives included in this review reported monitoring their service and described various processes including measuring patient outcomes, service productivity and quality metrics to maintain the designation of CoCE. Only six initiatives reported a structured process, where their ongoing performance was reviewed and assessed by an overseeing body to maintain their status as CoCE. Clearly, more attention should be paid to demonstrate the sustainability of excellence initiatives.

## Conclusion

Although CoCE are increasingly reported in the literature, there are inconsistencies in how these CoCE are established, monitored and evaluated. Processes used range from self-designation with no explicit criteria to using external evaluation and periodic recertifications. Features of CoCE centred around skilled medical and multidisciplinary teams and other resources such as infrastructure and equipment. More work is required to develop transparent systems and processes to ensure that centres claiming to be 'excellent' can demonstrate that they are delivering the highest quality care.

## Implication for practice and future research

This review highlights the need for clear criteria healthcare facilities can use to identify or establish a CoCE. The processes used also need to be transparent so they are easily available for certification or auditing purposes. The concept of a healthcare centre promoting 'excellence' can also vary depending on different perspectives: patient, systems or funding. There needs to be clear guidelines that highlight the impact of 'excellence' from these perspectives to ensure transparency on why a centre was nominated as a CoCE, and the monitoring processes used. It is recognised that staff well-being and retention contribute to more consistent healthcare delivery and

better patient outcomes, so including staff well-being in a CoCE framework may be of value. The findings from this review will contribute to international efforts to establish CoCE using robust, transparent criteria and key performance indicators.

### Strengths and limitations

The strengths of our scoping review include the inclusive search strategies (peer-reviewed journals and grey literature) and stringent review process using two independent reviewers throughout the process. There is a potential that there may be established CoCE that have not published any studies or reports, which we then have not identified. While we sought assistance from an academic librarian to ensure the search strategies were clear and comprehensive, centres that describe excellence using different terms and relevant information published in non-indexed sources may have been missed. This is a particular challenge of this focus of work which straddles healthcare organisation, clinical practice and academic research.

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### REFERENCES

- 1 Australian Commission on Safety and Quality in Health Care. *Cons and accred* 2019. Available: <https://www.safetyandquality.gov.au/standards/national-safety-and-quality-health-service-nsqhs-standards/assessment-nsqhs-standards/consumers-and-accreditation>
- 2 Mosadeghrad AM, Ghazanfari F. Developing a hospital accreditation model: a Delphi study. *BMC Health Serv Res* 2021;21:879.
- 3 Ziegelstein RC. Clinical Excellence in Cardiology. *Am J Cardiol* 2011;108:607–11.
- 4 Elrod JK, Fortenberry JL. Centers of excellence in healthcare institutions: what they are and how to assemble them. *BMC Health Serv Res* 2017;17:425:425.
- 5 Kapur N. On the pursuit of clinical excellence. *Clin Gov* 2009;14:24–37.
- 6 Manyazewal T, Woldeamanuel Y, Oppenheim C, et al. Conceptualising centres of excellence: a scoping review of global evidence. *BMJ Open* 2022;12:e050419.
- 7 Ramanathan S, Reeves P, Deeming S, et al. Implementing a protocol for a research impact assessment of the Centre for Research Excellence in Stroke Rehabilitation and Brain Recovery. *Health Res Policy Sys* 2018;16:1–10.
- 8 Wirtz J. Cost-effective service excellence in healthcare. *AMS Rev* 2019;9:98–104.
- 9 Moons K. A framework for operational excellence in hospital logistics. 2020.
- 10 Hellström T. Centres of Excellence and Capacity Building: from Strategy to Impact. *Sci Public Policy* 2018;45:543–52.
- 11 Kapur N. Professional bodies should provide accreditation of healthcare services to improve patient safety. *BMJ* 2015;351:h4420.
- 12 Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 2005;8:19–32.
- 13 Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. *Implement Sci* 2010;5:69.
- 14 Tricco AC, Lillie E, Zarin W, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med* 2018;169:467–73.
- 15 Thomas M, Magwire M, Gosch K, et al. Cardiometabolic Center of Excellence: A Novel Care Delivery Model for Secondary Prevention of Cardiovascular Disease in Type 2 Diabetes. *Circ Cardiovasc Qual Outcomes* 2021;14:e007682.
- 16 El-Eshmawi A, Castillo JG, Tang GHL, et al. Developing a mitral valve center of excellence. *Curr Opin Cardiol* 2018;33:155–61.
- 17 Lancellotti P, Dulgheru R, Sakalihasan N. Centres of excellence in heart valve surgery: are there standards for best practice? *Open Heart* 2015;2:e000282.
- 18 Chambers J, Ray S, Prendergast B, et al. Standards for heart valve surgery in a "Heart Valve Centre of Excellence". *Open Heart* 2015;2:e000216.
- 19 Daming TNB, Florio KL, Schmidt LM, et al. Creating a maternal cardiac center of excellence: a call to action. *J Matern Fetal Neonatal Med* 2021;34:4153–8.
- 20 Nakov R, Sarafov S, Gospodinova M, et al. Transthyretin amyloidosis: Testing strategies and model for center of excellence support. *Clin Chim Acta* 2020;509:228–34.
- 21 Piccini JP Sr, Allred J, Bunch TJ, et al. Rationale, considerations, and goals for atrial fibrillation centers of excellence: A Heart Rhythm Society perspective. *Heart Rhythm* 2020;17:1804–32.
- 22 Sandhu RK, Seiler A, Johnson CJ, et al. Heart Rhythm Society Atrial Fibrillation Centers of Excellence Study: A survey analysis of stakeholder practices, needs, and barriers. *Heart Rhythm* 2022;19:1039–48.
- 23 Williams BR. *Constructing a hypertrophic cardiomyopathy center of excellence. hypertrophic cardiomyopathy*. Springer, 2015:279–86.
- 24 Burkett D, Haldeman C, Page PS, et al. Centers of Excellence and Payer-Defined Quality Assessment. *Quality Spine Care: Healthcare Systems. Qual Rep and Risk Adj* 2019;355–67.
- 25 Martin RC, Pettitt JC, Pan X, et al. Spine centers of excellence: a systematic review and single-institution description of a spine center of excellence. *J Spine Surg* 2022;8:44–53.
- 26 Sheha ED, Iyer S. Spine centers of excellence: applications for the ambulatory care setting. *J Spine Surg* 2019;5:S133–8.
- 27 Wu S-J, Ma Q, Martin P, et al. Finding the Value in 'Value' Designation: Evidence and Opportunity in the United States. 2016;25:36–42.
- 28 Casanueva FF, Barkan AL, Buchfelder M, et al. Criteria for the definition of Pituitary Tumor Centers of Excellence (PTCOE): A Pituitary Society Statement. *Pituitary* 2017;20:489–98.
- 29 Frara S, Rodriguez-Carnero G, Formenti AM, et al. Pituitary Tumors Centers of Excellence. *Endocrinol Metab Clin North Am* 2020;49:553–64.
- 30 McLaughlin N, Laws ER, Oyesiku NM, et al. Pituitary centers of excellence. *Neurosurgery* 2012;71:916–26.
- 31 Tritos N. Pituitary Tumor Centers of Excellence, 2019. Available: <https://csrf.net/wp-content/uploads/2019/11/Centers-of-Excellence.pdf>

- 32 Distiller LA, Brown MA. Approaches to integrated diabetes care: A South African approach. *Integr Diab Care Springer* 2017;87:105.
- 33 Draznin B, Kahn PA, Wagner N, et al. Clinical Diabetes Centers of Excellence: A Model for Future Adult Diabetes Care. *J Clin Endocrinol Metab* 2018;103:809–12.
- 34 Carvalho B, Mhyre JM. Centers of Excellence for Anesthesia Care of Obstetric Patients. *Anesth Analg* 2019;128:844–6.
- 35 Silver RM, Fox KA, Barton JR, et al. Center of excellence for placenta accreta. *Am J Obstet Gynecol* 2015;212:561–8.
- 36 Santos-Moreno P, Caballero-Urbe CV, Massardo ML, et al. Systematic and progressive implementation of the centers of excellence for rheumatoid arthritis: a methodological proposal. *Clin Rheumatol* 2017;36:2855–8.
- 37 Haider MA, Burks FN, Cassell A, et al. The Role of Organizations like IVUmed in Developing Centers of Excellence. *Curr Bladder Dysfunct Rep* 2020;15:352–61.
- 38 Campbell A, Restrepo C, Mackay D, et al. Scalable, sustainable cost-effective surgical care: a model for safety and quality in the developing world, part I: challenge and commitment. *J Craniofac Surg* 2014;25:1674–9.
- 39 Choque-Velasquez J, Colasanti R, Baffigo-Torre V, et al. Developing the First Highly Specialized Neurosurgical Center of Excellence in Trujillo, Peru: Work in Progress—Results of the First Four Months. *World Neurosurg* 2017;102:334–9.
- 40 Deshmukh A, Radke U, Deshpande S, et al. Building Centres of Excellence in Dental Institute to Foster Organisational Development-A Preliminary Report. *JCDR* 2018;12.
- 41 Marinoff R, Heiberger MH. Lessons Learned from the Creation of a Center of Excellence in Low Vision and Vision Rehabilitation in Wenzhou, China. *J Vis Impair Blind* 2017;111:453–64.
- 42 Tapela NM, Mpunga T, Hedt-Gauthier B, et al. Pursuing equity in cancer care: implementation, challenges and preliminary findings of a public cancer referral center in rural Rwanda. *BMC Cancer* 2016;16:237.
- 43 Yao Q, Zhou G. Role of a center of excellence program in improving the quality of peritoneal dialysis—a Chinese experience. *Perit Dial Int* 2014;34 Suppl 2:S59–62.
- 44 Dietz MJ, Springer BD, Barnes PD, et al. Best Practices for Centers of Excellence in Addressing Periprosthetic Joint Infection. *J Am Acad Orthop Surg* 2015;23:S12–7.
- 45 King LY, Jamieson IR, Berg CL. Centers of Excellence in Hepatology: Making the Case to Insurers, Large Employers, and Patients. *Clin Gastroenterol Hepatol* 2021;19:2464–8.
- 46 Vivian E, Brooks MR, Longoria R, et al. Improving the Standard of Care for All-A Practical Guide to Developing a Center of Excellence. *Healthcare (Basel)* 2021;9:777.
- 47 Bitzer J, Reisman Y, Lowenstein L. Center of Excellence for Sexual Medicine. *J Sex Med* 2013;10:2127–8.
- 48 Chang D, Dayan J, Fried P, et al. Establishing Standards for Centers of Excellence for the Diagnosis and Treatment of Lymphatic Disease. *Lymphat Res Biol* 2021;19:4–10.
- 49 Pronovost PJ, Ata GJ, Carson B, et al. What Is a Center of Excellence? *Popul Health Manag* 2022;25:561–7.
- 50 Ferguson GM, Froehlich JA. Establishing a center of excellence: the Total Joint Center at the Miriam Hospital. *R I Med J* 2013;96:16.
- 51 Safer Care Victoria. *Centres of clinical excellence framework, Victoria*. 2021.
- 52 Wirth M, Fossati N, Albers P, et al. The European Prostate Cancer Centres of Excellence: A Novel Proposal from the European Association of Urology Prostate Cancer Centre Consensus Meeting. *Eur Urol* 2019;76:179–86.
- 53 Geetha D, Lee SK, Srivastava AJ, et al. Clinical excellence in nephrology: Examples from the published literature. *BMC Nephrol* 2015;16:141.
- 54 Kullar R, Nagel J, Bleasdale SC, et al. Going for the Gold: A Description of the Centers of Excellence Designation by the Infectious Diseases Society of America. *Clin Infect Dis* 2019;68:1777–82.
- 55 Li J, Burson RC, Clapp JT, et al. Centers of excellence: Are there standards? *Healthcare (Basel)* 2020;8:100388.
- 56 Steiner TJ, Göbel H, Jensen R, et al. Headache service quality: the role of specialized headache centres within structured headache services, and suggested standards and criteria as centres of excellence. *J Headache Pain* 2019;20:24.
- 57 Shikora SA, Delegge M, Van Way III CW. Creation of nutrition support centers of excellence: is it truly an excellent idea. *J Parent Enteral Nutr* 2010;34:106S–114S.
- 58 Griffiths P, Ball J, Drennan J, et al. Nurse staffing and patient outcomes: Strengths and limitations of the evidence to inform policy and practice. A review and discussion paper based on evidence reviewed for the National Institute for Health and Care Excellence Safe Staffing guideline development. *Int J Nurs Stud* 2016;63:213–25.
- 59 Stanger JD, Oliveira C, Blackmore C, et al. The impact of multi-disciplinary intestinal rehabilitation programs on the outcome of pediatric patients with intestinal failure: a systematic review and meta-analysis. *J Pediatr Surg* 2013;48:983–92.
- 60 Padula WV, Nagarajan M, Davidson PM, et al. Investing in Skilled Specialists to Grow Hospital Infrastructure for Quality Improvement. *J Patient Saf* 2021;17:51–5.
- 61 Pronovost PJ, Rosenstein BJ, Paine L, et al. Paying the piper: investing in infrastructure for patient safety. *Jt Comm J Qual Patient Saf* 2008;34:342–8.
- 62 Knowlton LM, Chackungal S, Dahn B, et al. Liberian surgical and anesthesia infrastructure: a survey of county hospitals. *World J Surg* 2013;37:721–9.
- 63 Stockley RC, Walker MF, Alt Murphy M, et al. Criteria and Indicators for Centers of Clinical Excellence in Stroke Recovery and Rehabilitation: A Global Consensus Facilitated by ISRRRA. *Neurorehabil Neural Repair* 2024;38:87–98.
- 64 Braithwaite J, Hibbert P, Blakely B, et al. Health system frameworks and performance indicators in eight countries: A comparative international analysis. *SAGE Open Med* 2017;5:1–10.
- 65 Aiken LH, Havens DS, Sloane DM. The Magnet Nursing Services Recognition Program: a comparison of two groups of magnet hospitals. *J Nurs Adm* 2009;39:S5–14.
- 66 Lasater KB, Richards MR, Dandapani NB, et al. Magnet hospital recognition in hospital systems over time. *Health Care Manage Rev* 2019;44:19:19–29:.
- 67 Willmington C, Belardi P, Murante AM, et al. The contribution of benchmarking to quality improvement in healthcare. A systematic literature review. *BMC Health Serv Res* 2022;22:139:139:.
- 68 Lymphatic Education & Research Network. Centers of excellence. 2023. Available: <https://lymphaticnetwork.org/centers-of-excellence>
- 69 Coon EA, Golden EP, Bryarly M, et al. A call for multiple system atrophy centers of excellence. *Clin Auton Res* 2022;32:205–8.
- 70 Creehan S, Cuddigan J, Gonzales D, et al. The VCU Pressure Ulcer Summit—Developing Centers of Pressure Ulcer Prevention Excellence: A Framework for Sustainability. *J Wound Ostomy Continence Nurs* 2016;43:121–8.
- 71 Santos-Moreno P, Galarza-Maldonado C, Caballero-Urbe CV, et al. REAL-PANLAR Project for the Implementation and Accreditation of Centers of Excellence in Rheumatoid Arthritis Throughout Latin America: A Consensus Position Paper From REAL-PANLAR Group on Improvement of Rheumatoid Arthritis Care in Latin America Establishing Centers of Excellence. *J Clin Rheumatol* 2015;21:175–80.
- 72 Santos-Moreno P, Castañeda O, Garro B, et al. From the model of integral attention to the creation of centers of excellence in rheumatoid arthritis. *Clin Rheumatol* 2015;34 Suppl 1:S71–7.
- 73 Shommu NS, Taylor LM, Panaccione R, et al. Nutrition Center of Excellence (COE) in Inflammatory Bowel Disease—A Model and Rationale for Development. *J Can Assoc Gastroenterol* 2019;2:63–70.