Developing and Validating a Conceptual Model of Recurring Problems in Teaching Clinic

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Abstract. Recurrent problems in medical teaching clinic are common and difficult to address because of complex interpersonal dynamics. To minimize this difficulty, we developed a conceptual model that simplifies problems and identifies the root cause of tension between groups in clinic. We used recursive analysis and modeling of the data from a larger multi-site, multi-method study of problems in teaching clinic. The first dataset from this study consisted of problem lists generated and prioritized by knowledgeable insiders from each site. The second dataset was a cultural consensus analysis independently performed at each site. The final model was checked for face validity and construct validity (using model predictions versus prior data and convergent/discriminant analysis). The study was performed in five Veterans Affairs teaching clinics in the U.S. Our final model, the Perception of Care Map, is a pentagram with five critical perspectives of the clinic visit. These five perspectives are structured care, educational care, relationship-based care, algorithmic care, and efficient care. Each group emphasizes one or more of these perspectives, and group locations on the conceptual map explain the observed tensions between groups. Validity of the model is high. The Perception of Care Map may be a useful adjunct for understanding and addressing recurrent problems in teaching clinic.

Key words: ambulatory care, education, graduate medical, patient-centered care

Recurrent problems in medical teaching clinic are multifaceted, complex, and difficult to address (Smith et al., 2004a). A valid tool that simplifies and structures an understanding of these problems would be useful for remediation. We report here on the development of a conceptual model, the

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‘Perception of Care Map’ (PCM), that we created after extensive analysis of data from a multi-site, multi-method investigation of problems in five VA teaching clinics.

This model is depicted as a pentagram (Figure 1) with five critical perspectives of the clinic visit that compete for conceptual predominance and resources. These five perspectives are structured care (knowledge of the patient, familiar clinic routines), educational care (graduated supervision and responsibility of trainees), relationship-based care (concern for patient as person and their medical choices, treating patients as individuals), algorithmic care (valid algorithms that can guide the provision or measurement of care), and efficient care (timely and productive). Data from our study of patients, residents, faculty, and administrators shows that, as groups, they adhere to different perceptions of how the visit should be conducted and are therefore located at very different places on this conceptual map. These different perceptions explain many of the recurrent problems seen in these teaching clinics. The PCM shows that none of the medical centers studied is particularly patient-centered as defined by efficient, structure-based care (the patient’s ideal of care).

![Figure 1](image-url). The perception of care map (PCM). This conceptual model shows five potential views of a clinic visit.
Face validity of the model was high with patients, residents, faculty, and administrators, with each research site, and at national and international meetings of medical educators. Construct validity was assessed by comparing the placement of groups in the model to between-group tensions identified in an earlier study, and by conducting a convergent/discriminant analysis using data from an anthropological tool called cultural consensus analysis.

Methods

This study was part of a larger study performed at five VA teaching clinics between March 2002 and July 2004. The Institutional Review Boards and affiliated Human Subjects Divisions approved the project at all sites.

Baseline study data

The first dataset (part of the larger study) explored the types of recurrent problems seen in these five teaching clinics (C.S. Smith et al., 2005a, submitted). Knowledgeable insiders participated in a standardized process to identify and prioritize the recurrent problems in their teaching clinic. This portion of the study found several types of conflicts (for instance, tension between administrators and faculty over productivity versus time spent teaching) that were common at multiple study sites. These conflicts stem from different perspectives about what is important in the clinic visit. Each group, or sub-culture, has a specific viewpoint about the visit that may be in tension with the viewpoints of other sub-cultures.

The other dataset used for this investigation was produced from a Cultural Consensus Analysis (CCA). CCA is a method used by anthropologists to determine which individuals within a large group form a cluster, or sub-culture, with shared values. We developed a CCA tool consisting of a set of 16 cards, each printed with one statement identifying “something that could happen during a clinic visit” (Smith et al., 2004b). As part of our larger study, we used this CCA to document that patients, residents, faculty, and administrators exist as different sub-cultures and have different medical values at five VA teaching clinics (C.S. Smith et al., 2005b, submitted).

In summary, the data from our larger study documented that each site had different sub-cultures, the sub-cultures had different medical values, and the tension created by these value differences corresponded to recurrent problems at that site.
Model creation

Analysis now shifted to refining our understanding of these important perspectives of the visit that each group was trying to preserve, organizing them into a stable conceptual model, and localizing each group within that conceptual model. Four analysts met regularly and proposed conceptual models as suggested by the existing data. Discrepancies were adjudicated by discussion and reformulation of the models, and by triangulation with all available data. This included not only the CCA and problem list data from this study (above) but also a factor analysis of the CCA data and questionnaire and focus group data from our CCA development study (Smith et al., 2004b).

Model validation

Face validity of the conceptual model was checked with each group studied (patients, residents, faculty, and administration) and with each of the five sites. We did this by presenting the model and asking if it seemed “true” to each subject’s experience of clinic (for groups) or each site’s array of problems.

Construct validity was assessed in two ways, and for both we proposed two CCA statements that matched each of the critical perspectives in the final conceptual model. For the first assessment of construct validity, a correspondence analysis (CCA statements and groups) was performed. We limited the dimensions of the analysis to only those that accounted for a greater percentage of the inertia than would be expected by random distribution. Geometric relationships from the correspondence analysis (proximity to indicator CCA statements) were converted to locations on the perception of care map (PCM). Then, each group’s location on the PCM was compared to the between-group tensions identified in our earlier study (C.S. Smith et al., 2005a, submitted).

For the second assessment, if the model had construct validity the two statements from the same perspective should have relatively high correlation (convergence) and statements from different perspectives should have low correlation (discrimination). We assessed convergent validity by calculating the Pearson correlation coefficient for the ranking of these same-quality CCA statement pairs across all groups and sites (i.e., the entire CCA dataset for the five sites). We assessed discriminant validity by calculating the Pearson correlation coefficient between all different-quality CCA statement pairs across all groups and sites. We used these convergent/discriminant validity scores to calculate a Z\text{contrast} score in order to quantify construct validity (Westen and Rosenthal, 2003).
Results

Model creation

Four analysts recursively proposed models, checked these against the study data, and modified them until a coherent conceptual model was established. This process required 12 meetings (approximately 60 hours) for analysis and comparison. The initial categories in the conceptual models came from our study of problems at these clinics (C.S. Smith et al., 2005a, submitted).

To begin, we hypothesized that different groups valued these perspectives differently and that this was a major source of tension between groups. To check this assumption, we examined graphs of the CCA data because CCA ranking differences between groups reflect differences in medical values (Smith et al., 2004b, 2005b, submitted). We compared these graphs to the

Statement:  Doctor asks what is changing in the patient’s life (such as move or major family changes)
Response:  Patient
   “I have a psychiatrist.” (patient ranked this statement 14th, where 1 is high and 16 low)
   “This doesn’t have anything to do with why I am here.” (ranked 16th)
   “I take care of my own important events.” (ranked 14th)
   “Personal things. Don’t like to talk about them.” (ranked 15th)
   Faculty
   “Need the personal contact and information.” (faculty ranked same statement 7th)
   “In chronic illness, it so often impacts personalized care.” (ranked 1st)
   “Connecting with the patient.” (ranked 5th)

Statement:  Have the same doctor for more than one year
Response:  Patient
   “Most important from the very beginning.” (ranked 1st)
   “Knows your problems.” (ranked 1st)
   “Recognize me.” (ranked 1st)
   “They have to know my ‘meds’ and tests and what works for me.” (ranked 3rd)
   Faculty
   “Only relatively important—may have bad doctor.” (ranked 12th)
   “Nice—not convinced it’s associated with quality.” (ranked 12th)
   “Reality issue [in a training program].” (ranked 14th)
   “Helps patient satisfaction—they still get good care.” (13th)
type and severity of problems independently identified by workgroups of knowledgeable insiders at each site (C.S. Smith et al., 2005a, submitted). During this analysis, we discovered the need to understand certain ideas more clearly such as relationship (the humanistic connection for doctors, continuity for patients) and certainty (specific clinical benchmarks for administrators, concrete diagnoses for residents). This analysis suggested, for instance, that doctors and patients viewed the “relationship” in fundamentally different ways.

To explore relationship further, we reviewed an old dataset that was used during CCA creation (Smith et al., 2004b). We examined patient and faculty rankings of two of the pertinent CCA statements, and their stated reasons (response) for that ranking.

These, and other similarly striking differences in meaning and value (ranking), led us to modify our understanding of the perspectives in the conceptual model. It was clear that faculty members were interested in relationship-based visits, visits that focused in a humanistic way on the patient as an individual. Patients, on the other hand, were more interested in structure-based visits, visits that led to mutual familiarity (clinic familiar with patient’s medical history, patients counting on familiar clinic procedure).

Through successive iterations such as this, the conceptual model became increasingly specified and integrated with the full range of data available. In the final modification of our conceptual model, these critical visit qualities were seen as different viewpoints about what the clinic visit should be based on. They were arranged in a pentagram and the vertices were defined to reflect our best understanding of each concept. Specific viewpoints of the clinic visit (vertices) are not mutually exclusive, although they do tend to compete with each other.

Validation

Face validity

Face validity of this model was high with groups and sites. The model triggered similar stories about problems and experiences from patients, faculty, residents, and administrators that reviewed it (approximately 20 in each group). The model also provided new insights to knowledgeable insiders at the five study sites about their particular problems and possible solutions.

Construct validity (groups/tensions)

For all construct validations, the following “indicator” CCA statements were linked to each vertex of the pentagram.
The correspondence analysis of CCA statements and groups demonstrated two significant dimensions. Thus, a two-dimensional map was created, with dimension one being the horizontal axis and dimension two the vertical axis. Proximity of each group to the indicator CCA statements on this map was translated to a location on the PCM. The location of each group on the PCM is shown in Figure 2. These locations correlate very closely with the major tensions identified in our earlier study. For instance,

*Structured care*
- Have the same doctor for more than one year.
- Let the patient know about the lab results.

*Educational care*
- Senior doctor reviews student doctor’s work.
- Have senior doctors around to answer questions for student doctors.

*Relationship-based care*
- Doctor asks what is changing in patient’s life (such as a move or major family change).
- Doctor and patient agree on goals.

*Algorithmic care*
- Talk to the patient about healthy lifestyle changes (such as exercise, stop smoking, limit alcohol).
- Doctor gets a reminder to talk about healthy habits and test for silent diseases.

*Efficient care*
- See the patient within 15 minutes of the appointment time.
- Stay on time to see as many patients as possible.

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our earlier study indicated that patients preferred efficiency and structure and were most willing to give up relationship (C.S. Smith et al., 2005a, submitted). This was confirmed independently in the correspondence analysis. Accordingly, the location of the patients on the PCM is closest to the structure and efficiency vertices and furthest from the relationship vertex. Doctors (both residents and faculty) are closest to the educational and relationship-based poles, with residents somewhat more interested in algorithmic care. Administrators are located near the algorithmic and efficient care vertices. These PCM locations suggest high construct validity when compared with the empirically derived between-group tensions from our previous study seen in Table I (C.S. Smith et al., 2005a, submitted).

**Construct validity (convergent/discriminant analysis)**

We predicted a convergent correlation (between CCA statements from the same vertex) of 0.3 and a divergent correlation (between any CCA statements from different vertices) of 0. The entire CCA dataset was then analyzed. Pearson correlations between concordant statements averaged (+) 0.2428. Pearson correlations between divergent statements averaged (−) 0.089. The $Z_{\text{contrast}}$ score for these predictions and results was 5.41, corresponding to a $p$-value <0.001 (Westen and Rosenthal, 2003). These measures further support construct validity for the PCM.

**Discussion**

VA teaching clinics, like most academic medical centers, are struggling in the current health care milieu. The first step in addressing problems is to clearly understand their root causes. We have recursively analyzed the data from a multi-site, multi-method study of VA teaching clinics to arrive at a
conceptual model of recurring problems. This model is composed of five perspectives about the clinic visit that, singly or in combination, explain how each group views the visit. These are: structured care, educational care, relationship-based care, algorithmic care, and efficient care. Face validity and construct validity of the model are high.

We hypothesize that tension between groups, based on their location in the model, is the root cause of the majority of problems in clinic (C.S. Smith et al., 2005a, submitted). The PCM predicts significant tension between administrators and physicians over the competing medical values of efficiency, where the patient is seen within 15 minutes of their scheduled visit, versus training and relationship-based care, where faculty are available in teaching clinic and can take the time to get to know the patients.

Patients want the clinic to be familiar with their medical history, and they want familiar procedures and timely information sharing, such as promptly receiving lab results. Patients will conflict with administrators over their preference for structured care, highlighted by the patient’s desire for the same doctor at each visit, versus the administrator’s preference for a “one-size-fits-all” algorithmic care model, which deemphasizes one doctor ↔ one patient and focuses instead on performance measures such as screening and lifestyle changes.

Patients may have conflict with physicians over time spent on humanistic conversation unless it is seen as specific treatment, particularly given the inefficiencies of current visit structures. Both the raw data and the various prior analyses are replete with examples of these tensions (Smith et al., 2004a, b, 2005a, b, submitted).

The PCM shows that none of the medical centers studied is particularly patient-centered as defined by efficient, structure-based care (the patient’s ideal of care). To become more patient centered, clinics must adopt better systems for laboratory results notification, increased familiarity with the patient’s medical history (especially in teaching clinics with changing doctor assignments), and improved handling of unscheduled drop in and phone in visits.

Conclusions

Academic clinics continue to struggle with organizational dynamics, funding decisions, and team cohesion. Recurring problems can seem complex, interconnected, and unmanageable. To provide a response to this situation, we have developed a valid conceptual model, the Perception of Care Map (PCM), which can simplify these complex problems. We accomplished this by studying difficulties identified at five VA teaching clinics.
The PCM simplifies analysis by demonstrating that each sub-culture emphasizes different critical aspects of the clinic visit. The relative locations of each group on the PCM predict specific tensions and suggest approaches for remediation. It is possible that the existing cultural consensus analysis can be applied to new sites, with special attention to the key indicator statements, and that these sites’ sub-cultures could also be located on the PCM. This robust and site-specific data could be used to inform remediation at that site. This promising new approach should be prospectively tested and coupled with attempts at concrete PCM-suggested improvement initiatives at new sites. We believe the PCM provides hope for addressing recurrent problems plaguing beleaguered academic clinics.

References

