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**Professional or administrative value
patterns: clinical pathways in medical
problem-solving processes***

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ABSTRACT

A health care organization simultaneously belongs to two different institutional value patterns: a professional and an administrative value pattern. At the administrative level medical problem-solving processes are generally perceived as the efficient application of familiar chains of activities to well-defined problems; and a low task uncertainty is therefore assumed at the work-floor level. This assumption is further reinforced through clinical pathways and other administrative guidelines. However, studies have shown that in clinical practice such administrative guidelines are often considered inadequate and difficult to implement mainly because physicians generally perceive task uncertainty to be high and that the guidelines do not cover the scope of encountered deviations. The current administrative level guidelines impose uniform structural features that meet the requirement for low task uncertainty. Within these structural constraints physicians must organize medical problem-solving process to meet any task uncertainty that may be encountered. Medical problem-solving processes with low task uncertainty need to be organized independently of processes with high task uncertainty. Each process must be evaluated according to different performance standards and needs to have autonomous administrative guideline models. Although clinical pathways seem appropriate when there is low task uncertainty, other kinds of guidelines are required when the task uncertainty is high.

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Introduction

Competing institutional value patterns. Organizations in an institutional environment generally seek to copy each other to gain legitimacy rather than efficiency. Although organizations adapt to their environment, they also create their environment in the sense that together they form a sector, field, or profession [1]. Generally, an organization belongs to just one sector or field and therefore relates to one specific institutional value pattern. However, health care is an example of an organization that belongs, simultaneously, to two different value patterns – the medical professional and the administrative.

In health care organizations, the different value patterns occur at two different levels. At “work-floor” level the physicians generally have supreme authority in actual medical problem-solving processes, and professional value patterns predominate at that level. However, the organization above the work-floor level is generally governed through administrative routines and other principles of bureaucracy – an administrative value pattern often referred to as “professional bureaucracy” [2, 3].

The administrative value pattern derives from principles of ordering, structuring, and streamlining production processes [4]. From an administrative perspective, the main task is regarded as facilitating and streamlining the medical “production processes” related to the various medical “production” departments. At the “work-floor” level, the value pattern emerges from the training of medical personnel in rational decision making according to medical practice upheld by various professional medical associations.

Task uncertainty. In an ideal model of problem-solving, a problem is defined and then a course of action is chosen to diminish the gap between the problem situation and

the preferred situation. However, in medical problem-solving, this ideal is not always found because of the widespread variables associated with each problem, and the preferred situation is not always identifiable. For instance, although health may be preferred to illness, the choice between longer life and better quality of life is not so obvious. Furthermore, in the choice of actions necessary to change a situation, from bad to something less bad, many different, less bad situations may be possible. Generally, the preferences among these less bad situations have not been identified and the knowledge of the relationship between cause and effect of action is not always profound.

In quantitative decision theory, decision-making is commonly classified according to whether choices are made under conditions of certainty, risk, or uncertainty depending on the existing statistical knowledge about the probability of the outcome [5]. However, in a medical problem-solving situation there is certainly a need for knowledge about more than just the probability of the outcome. What is required is knowledge of how to define the initial situation, possible alternative actions and the value of the probable outcomes of each action.

In the clinical practice, task uncertainty is inherent in most medical decision situations. Factors contributing to uncertainty include biological variability of patients, physician bias, errors in test interpretation, differing values and opinions of patients and physicians, and uncertainty surrounding the decision-making situation [6, 7, 8].

Therefore, task uncertainty may be defined as a lack of reliable knowledge or perception of all relevant aspects of a choice in a problem-solving process [9].

Clinical pathways and guidelines. An administrative method to reduce the perceived task uncertainty in medical problem-solving processes is to introduce

standardised procedures such as evidence-based guidelines and clinical pathways to guide physicians' actions. However, in clinical reality a physician has to consider perceived variations in patients' conditions, possible test errors and various organizational obstacles. Such issues have mainly been disregarded in the construction of evidence-based guidelines and pathways [10], and this tends to obscure the uncertainty inherent in patient care [11]. Therefore, in clinical reality, physicians do not always find administrative guidelines to be appropriate when all circumstances are considered. A certain guideline or clinical pathway is just one of the many factors to take into account. To cope with the general task uncertainty inherent in clinical practice, physicians often use provisional decisions that allow for changing priorities and circumstances over time and these contribute to variability in medical problem-solving processes [9, 10]. Studies of physicians' attitudes to guidelines and barriers to guideline adoption also show that physicians have multiple reasons for not adhering to guidelines [10, 12, 13, 14]. Contextual factors and structural features of health care organizations seem to enhance task uncertainty and therefore play a critical role as obstacles to implementation of guidelines. Moreover, the emergence of new systems and operational principles seem to have generated new uncertainties and ambiguities that further increase the perceived task uncertainty in medical problem-solving [15].

Administrative Level Perspective

At the administrative level, the mental picture of medical problem-solving processes appears to be based mainly on wishful thinking, i.e. that medical science provides uniformly perfect technology for cases with clearly defined problems. Therefore, from

an administrative perspective, the main task in medical problem-solving is perceived to be the efficient application of various well-established chains of activities to address well-defined problems. Actually, this view is a general phenomenon; as Cochrane [16] noted, “There are too many enthusiastic economists willing to assume that all medical therapy is 100 per cent effective and 100 per cent efficiently deployed in order to justify their hurry to optimise.” [16: 77]. In order to optimise, the administrative level tends to impose tight controls through standardisation, routinisation, and performance monitoring. Such tendencies are also in accordance with the more general ideas of the so-called “new public management” [4].

At the administrative level, medical problem-solving processes are perceived to be about the application of perfect medical technology to patients with obvious problems – e.g., casualties and injuries. A case of a patient with a patella fracture is used here to illustrate a problem-solving process in accordance with the administrative perception of low task uncertainty.

Patella fracture. The reason for this medical condition is often a fall or a traffic accident. Normally, the patient is brought to the emergency unit and then sent to the X-ray department to confirm the diagnosis. The physician must then decide if an operation is necessary or if the injury will heal properly with stabilisation and rest. If an operation is necessary e.g., because of a splinter fracture, the patient is first admitted to a ward. Blood tests are carried out, and an anaesthesiologist is contacted to decide on the anaesthetic method. After the operation, the knee is immobilised with plaster and the patient is brought to the postoperative unit. Depending on the general condition, the patient may be sent home after a few hours or may be returned to the ward for a day or two. Figure 1 illustrates the problem-solving process for a patient with a patella fracture.

Insert figure 1 about here

The general image provided here is rather similar to the assembly-line production in the car-manufacturing industry. In this smooth-looking medical problem-solving process, the administrative and the professional level perspectives are in accordance with each other; because both perspectives can be related to an assembly line metaphor. Although cases with such low task uncertainty are common, there are other cases with a much higher task uncertainty. Such cases may display the actual problem-solving process as a labyrinth rather than the neat production line shown here.

Professional Level Perspective

During a routine workday, the individual physician encounters a stream of patients with varying problems and, therefore, the main task is perceived as one of handling different patients, each with unique and unpredictable medical problems. Not all patients suffer from conditions with high task uncertainty in the problem-solving, but a physician generally encounters a mixture of varying problems, and this variation enhances the impression of general high task uncertainty. The actual uncertainty level varies. Some cases may be diagnosed easily and the technology involved in the problem-solving process may be nearly perfect. Other cases may be difficult to diagnose, and without a clear diagnosis, problem-solving will be a trial-and-error process with a high degree of uncertainty.

In general, the perceived combination of different degrees of task uncertainty has resulted in a tendency to arrange medical problem-solving processes in a way that

allows maximum flexibility. However, this adaptation to task uncertainty is only partial because the problem-solving process has to be accomplished within the restrictions imposed by the administrative level structure. As an example, a patient suffering from a stroke is used here to illustrate a problem-solving process with high task uncertainty.

Stroke. In the case of an acute stroke, the symptoms develop rapidly, resulting in aphasia and/or partial paralysis of face, arms, or legs. Consciousness may be clouded. Through X-ray or CT scanner, the condition is differentiated from, for instance a rapidly growing tumour, haematoma, or haemorrhage. A chest X-ray is taken to check for lung tumours and cardiovascular disorders. Laboratory tests are usually non-specific. In the problem-solving process, specialists from other departments such as cardiology, X-ray, and medical laboratories are called in as consultants. Treatment of a patient in a coma includes airway maintenance, adequate oxygenation, and providing fluids. Possible heart failure and hypertension are treated. Early and regular appraisals of the patient's status by the physician, physiotherapist, occupational therapist, speech therapist, and the nursing staff are necessary to design a rehabilitation program.

On recovery from the acute dysfunction, the patient is moved to an internal medicine unit for the treatment of underlying disorders of heart disease and hypertension. To rehabilitate the patient, other professional groups such as physiotherapists and dieticians are brought in. The formal responsibility for a patient is with the physician, but the actual responsibility may vary depending on the patient's need at any particular point in time. Figure 2 illustrates a problem-solving process for a patient suffering from a stroke.

Inset figure 2 about here

The figure illustrates a case of high task uncertainty, where there is a conflict or misfit between the administrative and professional perspectives. From an individual physician's point of view, the "flow" of patients looks more like a maze than a streamlined workflow. Furthermore, only the first part of the care (at the hospital) is illustrated. In this example, surgery was not involved. If it had been, the paths might have been too complex to illustrate comprehensively.

Conclusions

From the administrative level perspective, the general structure of a hospital is designed to handle (supposedly streamlined) medical cases with assumed low task uncertainty. Within this structural context, the professional problem-solving processes must provide for the handling of cases with both high task and low task uncertainty. For cases characterised by low task uncertainty, the administrative-level image of a production line may be an appropriate metaphor, and production planning may be possible. However, for cases characterised by high task uncertainty, planning and streamlined processes are seldom appropriate. Instead of process planning, patients may be "stored" in beds between the various processes, and deviations from expected developments are mainly observed through the physicians' daily rounds. Such routines are tokens of adaptation to high task uncertainty. However, since these routines are also applied to cases with low task uncertainty, they reduce the possible production planning for such cases. Because all problem-solving processes are forced into the same structural features, they also tend to disturb one other, thus making the organization less suitable for any of the problem-solving processes regardless of the degree of task uncertainty.

The mixture of cases with differences in task uncertainty puts different demands on the structure. This means that a serious problem in the health care organization is the poor fit between the uniform organizational structure imposed by the administrative level and the perceived need for flexibility at the professional level. To improve the situation, medical problem-solving processes with differences in the degree of task uncertainty need to be performed in different structural settings.

The need for varying structural settings is, for instance, demonstrated in a study by Panella et al. [17] of constructed clinical pathways for hernia repair, stroke, renal failure, heart failure, and hip replacement. They found the clinical pathways for hip replacement appeared to be effective in reducing unnecessary variations and improving outcomes and quality of care. On the other hand, the implementation of the clinical pathways for strokes and for renal failure had to be discontinued because the pathways seemed to be inadequate. The clinical pathway for strokes in particular, appeared to have no benefit for the outcome or processes. In their comments on this study, Taylor et al. [18] argue that the complexity of acute stroke care cannot be described adequately within a clinical pathway. Furthermore, in another study by Sydney et al. [19], data from 26 surgical pathways were examined; and they noted that clinical pathways may be effective only in relation to certain well-defined situations.

The result of these studies [17, 18, 19] seem to support the conclusion that clinical pathways and production-line organization are effective mainly in problem-solving processes where there is low task uncertainty. For processes with high task uncertainty, this practice might just mean that the same patients would constantly reappear for treatment without actually having their problems solved.

Implications for the health care structure. The main implication of this conclusion is that health care needs to be organized in different ways depending on the degree of task uncertainty. In situations with *high task uncertainty*, it is important to guard against premature development of routines. Because of this, it is important that performance is not evaluated according to norms of productivity such as benchmarks and other quantitative measures [20]. Instead, the norms that need to be stressed are those concerning professional development; evaluation of performance may then be made in qualitative terms regarding the gain of knowledge. This suggests the need to build separate problem-solving groups around each type of problem – i.e., symptoms or syndromes instead of diagnoses – to ensure the accumulation and systematisation of knowledge [21]. The acquisition of data becomes important, and to interpret data, problem-solving groups would need to have, within themselves, a grounding in different kinds of knowledge [22, 23].

In situations with *low task uncertainty*, there is generally an established sequential order between activities. It is therefore essential that all technical resources and skills needed in the problem-solving process are grouped together and administered as self-contained “production lines” [22]. Coordination of time and place may be accomplished through organized production planning. To enhance efficiency, integration of resources may be accomplished through network planning of these “production lines” [24]. Evaluation of performance can be in quantitative terms concerning productivity or production throughput. This would be in line with the kind of streamlined production lines advocated in an article by Berg, Schellekens, and Bergen [25].

Implications for clinical pathways. In the present form, clinical pathways seem to be applicable mainly to situations where there is low task uncertainty. In situations with

high task uncertainty, there is no one “best way.” It depends on the actual circumstances, such as the patient’s condition, side diagnoses, or other variations related to the individual patient. The problem-solving process is also influenced by factors related to the detailed organizational setting such as what facilities, medical professionals, or competencies are available at the time of the consultation. The point is that in a situation with high task uncertainty there is not just one “best way” – there may be many. Therefore, in situations with high task uncertainty, clinical pathways most probably will result in premature routinisation. Furthermore, the introduction of such pathways would likely hamper development because physicians may be reluctant to deviate from what is considered to be the “proper pathway”. So, although clinical pathways may be of value in situations where there is low task uncertainty they may be detrimental in other situations. When there is high task uncertainty, different kind of guidelines seems to be needed. Instead of prescribing the one “best way” there is a need for guidelines that define those “worst ways” that should be avoided in the clinical practice. Such guidelines will also require research directed towards investigating obsolete and inefficient methods.

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Figure 1. The patient-flow from the administrative level perspective.

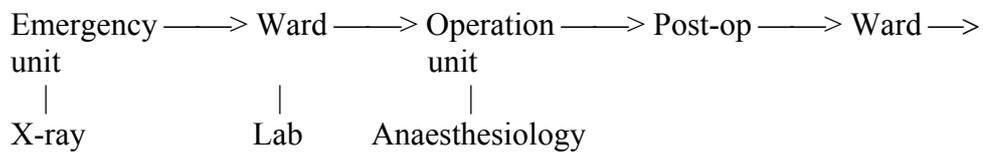


Figure 2. The patient-flow from an individual physician's perspective.

