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Cure for increasing health care costs: The Bernhoven case as driver of new standards of appropriate care

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ABSTRACT

Containing costs is a major challenge in health care. Cost and quality are often seen as trade-offs, but high quality and low costs can go hand-in-hand as waste exists in unnecessary and unfounded care. In the Netherlands, two healthcare insurers and a hospital collaborate to improve quality of care and decrease healthcare costs. Their aim is to reduce unnecessary care by shifting the business model and culture from a focus on volume to a focus on quality. Key drivers to support this are taking time for integrated diagnosis ('first time right'), the right care at the right place and shared decision making between doctor and patient. Conditions to realize this are 1) contract innovation between the hospital and insurers to move away from fee-for-service reimbursement, 2) a culture change within the organization with emphasis on collaboration and empowerment of medical leadership and physicians to change daily practice, and 3) a reorganization of the hospital organization structure from a large number of medical departments to four business units related to the fundamental underlying patient need (acute care, solution shop, intervention unit and chronic care). Results from this whole-system-approach experiment show it is possible to provide better care (as experienced by patients) with lower volumes (16% lower DRG claims after 3 years) and provides valuable lessons for further healthcare reform.

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1. Introduction

Cost and quality are often seen as a trade-off under the assumption that more care is better and quality is therefore costly. However, mounting evidence challenges this assumption. High quality and low costs can go hand-in-hand and significant (up to 30%) "waste" exists due to unnecessary and unproven care [1–4]. Moreover, studies show that volume of care increases significantly in fee-for-service systems, while this is not necessarily associated with improved health outcomes [5]. While the growing number of elderly patients as well as innovations are often seen as a root cause of increasing health care costs, Dutch studies show incentives for productivity are the main drivers of cost growth [6].

This underlines the need for bringing quality and costs in harmony. But in reality, this is very difficult to implement due to a lack of available data and ability to leverage this data for decision making [7]. The challenge of improving care and saving costs has been studied widely. Several overarching concepts have been launched, such as The Triple Aim [8], Value Based Healthcare [9] and the Chronic Care Model [10]. In addition, many studies have been published about reimbursement interventions for increasing quality and decreasing costs [11]. These concepts and studies offer many valuable elements for change of which elements are used, but the power of the Bernhoven transformation is the integral approach of changes in structure, culture, medical content and financial incentives in alliance with payers.In addition, it is difficult to differentiate between "doing things right" (technically successful execution) and "doing the right things" (appropriate care) from a value equation. This is important, as the appropriateness of care, mainly influenced by the quality of the decision-making process, may have a large effect on reducing volume (growth) and improving outcomes of patients in line with their needs, preferences and values [12]. Furthermore, outcomes do influence costs, but the impact of an agenda that focuses also on the appropriateness of care may be far bigger.

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Table 1
Characteristics of Bernhoven hospital.

Hospital type	General hospital, medium size (in Dutch context)
Population served	280,000 inhabitants
	336,145 new outpatient visits
	17,774 admissions
Staff	140 medical specialists
	2250 employees
Capacity	380 beds
	18 ICU beds
	8 operating rooms
Annual revenue	ẼUR 200 M

In the Netherlands, two health care insurers and a hospital are collaborating to decrease health care costs by focusing on quality and appropriateness of care. This article describes how these organizations have aligned internal and external incentives and created the preconditions to enable the hospital to provide better care at lower costs. We believe this case has broader implications for healthcare reform as it allows insurers to get a beyond-the-surface understanding of practice variation and creates a new benchmark that is based on quality initiatives of professionals.

2. Local context of the Bernhoven hospital and rationale for change

Bernhoven is a mid-sized, general hospital in the south of the Netherlands (see Table 1 for basic data [9]). In 2013, management and medical staff jointly decided to develop a new strategy for hospital as they saw several opportunities and reasons for choosing a new path. First, both management and medical staff had a desire to do things differently as they saw that the healthcare market in the Netherlands was about to change. Increased competition and consolidation raised questions about the sustainability of relatively small local hospitals. Although the hospital was financially healthy, there were questions whether in the long run it would survive independently or become a dependence of a larger hospital nearby. Specifically, the new hospital was originally built on a financial business case of 1–2% growth per annum and the question was whether Bernhoven could deliver on that growth. Second, the new hospital building created an environment where management and medical staff were open for change as new ways of working together had to be developed. Finally, Bernhoven had created an environment where change became possible as the goals and incentives of management and medical staff were aligned with its governance model. Within that context, Bernhoven decided to start an alliance with its main healthcare insurers CZ and VGZ and jointly developed the 'hospital of the future'.

3. The idea: providing better care at lower costs

By collaborating, the hospital and health care insurers wanted to implement incentives aligned with the joint objective to provide better care at lower costs. A consulting company, Strategy&, who published a report 'Quality as Medicine' on this topic, was brought in [13]. Within the hospital a small coalition, including the CEO and several medical specialists crafted a new strategy called "Dream", symbolizing the hospital of the future. The final idea suggests a new approach towards quality and costs and the relation between payers and providers, with the following guiding principles:

a Collaboration between hospitals and health care insurers is needed so that quality can be improved and costs can be saved, which is a joint social responsibility and shared value.
b Hospitals and their professionals are the key-experts in quality improvement
c Health insurers have the primary role of guarding costs from a societal perspective and the system of regulated competition with other insurers provide them the incentives to lower cost in order to lower the premiums and win clients.
d If quality improvement is focused on the appropriateness of care and patient-centered organization of care, it can be a strong driver for cost reductions.

These guiding principles are important ingredients for a successful change in health care delivery. First, the transformation of the relationship between provider and insurer from opponent to partner, changes the dynamics from negotiating on short term quotas to collaborating on long term shared objectives, is needed to overcome (financial and other) barriers.

Second, by respecting and valuing each other's complementary views and expertise, payers and providers can collaborate in a more effective way regarding cost containment and quality improvement. Often, payers use measures such as prior authorization, limiting indication setting for treatments to control costs. This frustrates medical specialists, who feel restricted in acting on their professional opinion and intrinsic motivation to provide the best care to their patients. Third, by focusing on appropriateness and patient-centered organization of care, the hospital can provide high quality care at lower costs.

Appropriate care reduces waste and iatrogenic harm. An important driver to improve appropriate care is the quality of decision-making, an underestimated dimension of quality of care. The assumption was that investing in high quality integrated decision-making results in less (invasive) treatment and better patient outcomes and satisfaction [14]. There is evidence that patients choose more conservative approaches when they become better informed, although it is not proven that the implementation of patient decision support interventions leads to decrease of volume and costs [15]. Improving the quality of decision-making includes enough time for communication between doctors and patient, support by decision support tools (shared decision making), and direct involvement of all medical disciplines applicable to the diagnosis and the patients' medical history and prevailing co-morbidities.

Creating an environment of patient-centered care can be attained by removing organizational silos and reinforcing collaboration between different medical departments inside the hospital and in collaboration with general practitioners. This also enables intra and inter organizational synergies and allows for redistribution of care in the region.

- Intra organizational synergies: For example, operational efficiency can be achieved by matching supply with demand on an organizational level instead of an individual department level.
- Inter organizational synergies. For example, chronic care can be organized in a care network with medical specialists and primary care givers and patients are empowered to self-manage as much as possible. Expensive hospital visits are then only planned when indicated by the care network.
- Redistribution of care: patients are treated in the most affordable and patient-friendly location that can provide high quality. Active engagement with general practitioners is used to prevent unnecessary referral to the hospital and early referral back to the general practitioner when follow-up in the hospital has no added value anymore.

The cultural change, business model innovation and alignment of internal incentives needed to enable this, are elaborated on under 5.

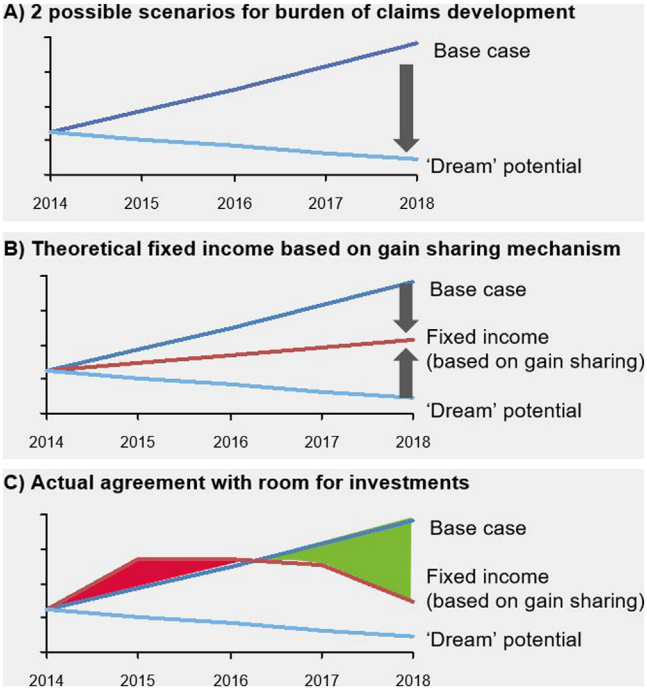

Fig. 1. Illustration of the contract innovation between Bernhoven and its insurers. X-axis presents the (theoretical) burden of claims and actual fixed income agreement; Y-axis presents time in years. A) 2 possible scenarios for how burden of claims could develop: base case with historical growth rate and 'Dreaḿpotential based on estimated 10% reduction in claims. B) Theoretical fixed income agreement based on gain sharing between hospital and insurer. C) Actual agreement with room for investments in the first 2 years and lower income in the last 2 years.

4. Setting the right external incentives: Contract innovation for health care reimbursement

Previously, contracts for health care reimbursement followed a fee-for-service model and were renegotiated on a year-to-year basis focusing mainly on costs and volume quotas. The contract innovation constitutes of a 5-year contract runtime, with a guaranteed stable income for the hospital, regardless of the volume and burden of claims. The contract was provided on the following conditions: 1) patients in the Bernhoven region do not seek treatment more often in other surrounding hospitals, 2) waiting times for patients do not increase.

In addition, the contract included additional budget in the first two years to facilitate the transition (e.g. IT investments, temporary additional employees) and a decrease in revenue in the second part of the term when volumes have been reduced. The contract was essentially set up with a gain sharing mechanism between a base scenario with increasing claims and a 'Dream' scenario that was forecasted with a 10% reduction in the burden of claims in 5 year (Fig. 1).

By providing a pre-investment and guaranteeing relatively long-term income and by moving away from fee-for-service, the insurer enables the hospital to have a long-term view on quality improvement. It can invest in a business model innovation to provide more appropriate and patient-centered care. Also, the hospital is incentivized to reduce costs and stop unnecessary volume, as this will further reduce costs. In addition, the fixed income for the hospital was also translated to the medical specialists who all became employed by the hospital and their personal income did not depend anymore on volume.

5. Creating the preconditions: Business model innovation (A), organizational culture (B) and alignment of internal incentives (C)

A Business model innovation

As most hospitals, Bernhoven was organized in medical departments working as independent self-employed partnerships. This organizational model is complex and decentralized, making it difficult to govern, monitor and manage performance and implement hospital-wide improvements. Moreover, a compartmentalized structure supports a silo culture between different departments, while patients increasingly require multidisciplinary care. The fundamental reason hospitals are difficult to govern is that they consist of very different underlying business models. Clayton Christensen, author of the book '*The Innovators Prescription*' states that hospitals '*are jumbled mixtures of multiple business models struggling to deliver value out of chaos*" [16,17]. He distinguishes 3 separate business models that apply universally to all business and is also relevant to healthcare: solution shops (where patients get the right diagnosis and treatment plan), value added processing businesses (where patients are treated) and facilitated user networks (where patients are supported to live with chronic conditions).

This thinking inspired a new operating model and organization structure for Bernhoven based on the patient journey and the underlying business model. In a move away from the existing medical department silos, 4 multidisciplinary business units were created to stimulate collaboration and multidisciplinary care and signify a shift from a doctor-centered to patient-centered organization of care:

- Diagnosis and decision making unit ('Solution shop') with outpatient care, consultations and diagnostic
- Intervention unit for surgical and non-surgical interventions: operating theater, inpatient care
- Acute care unit: Emergency department with all unplanned, acute care (consultations, diagnostics and inpatient care)
- Chronic care unit: (virtual) Network of healthcare professionals to support chronic patients

Both the underlying patient need and the dynamics in each business model differs in terms of the definition of quality, cost structure and economics of the underlying organization. Therefore, separating them also allowed to optimize and tailor each organization in terms of e.g. planning procedure, support staff and overhead costs and managing performance and quality.

Patients are typically referred from the GP to the diagnosis and decision making unit. This outpatient unit supports multidisciplinary cooperation in order to come up with a 'first time right' diagnosis. Second, it allows for extra time taken to develop a treatment plan together with the patient (e.g. supported by shared decision making methods). Quality is defined as the quality of the decision-making process and extend to which the patient's context is taken into account as measured for example by the COLLABORATE questionnaire [18]. This often means that taking more time in the decision-making unit will prevent unnecessary care later on.

Once a treatment plan is agreed upon, a patient can go to the intervention unit. This organization is set up as a focused factory with a number of intervention lines. Clustering interventions and working with dedicated teams per intervention type increases the routine and ability to continuously improve procedure and outcome.

In acute care, a combination of a high-turnover solution shop and intervention unit was needed: an adequate triage and fast diagnosis and treatment are of utmost importance. All major disciplines were represented in the acute team, supporting an integrated

multidisciplinary approach. By completely separating acute from elective care in the operations, the availability of human resources and operating rooms for elective care would not be disturbed by having an "acute case". And vice versa: medical specialists are now dedicated to acute care, where they previously needed to be "drawn away from a busy outpatient clinic".

The chronic care line is organized as a (virtual) network with healthcare professionals inside and outside the hospital. Instead of regular appointments, patients are educated and empowered to self-manage their disease and monitor for alarm signals, using a network of caregivers as consultants when necessary. Collaboration of medical specialists with the first care line (e.g. GPs, physiotherapists) is standard practice.

B **Organizational culture**

An intensive culture change program was initiated to engage employees in the new strategy of the hospital and make "Dream" a reality. A paradigm shift was needed from volume (productivity and growth mindset) to a focus on quality: quality improvement as a means to decrease costs. Recent literature point out that this frame should be incorporated in each and every decision made in the hospital by providers and managers in order to reform healthcare [19]. Where high quality was seen as individual prestige, it should now be driven by collaboration between all health care providers both within the hospital and GPs. The culture should therefore become more collaborative and outward looking: existing silos needed to be broken down to enhance interaction with other health care providers. Also, all care that would not necessarily improve the outcomes valued by the individual patient should be abandoned. The patient should therefore become a partner in diagnostic and treatment decision-making and the needs to support patient-centered care in the region should to be put before the individual objectives of employees. It was essential that this collaborative and value based quality culture would be embraced strongly by all employees of the hospital.

To incorporate the new way of thinking on the work floor, the employees at every level of the organization were invited to think of quality initiatives that were in line with the aim of quality improvement and cost reduction. Initially, the focus was on involving the physicians, because they are the main change agents. Later on, the focus shifted and nurses and patients got involved. A program bureau was initiated to support the conduct of these bottom-up quality initiatives and over 100 projects were brought in over a short period of time of which fifty-nine were implemented in the period 2014-2017

C **Aligning internal incentives**

An important precondition to carry out the hospital's objectives was to align the incentives and improve the collaboration among major stakeholders within the hospital e.g. administrative managers and medical specialists. The objectives of the 18 individual self-employed partnerships were not necessarily aligned with each other or with the overall hospital objective. For instance, each medical specialty/ partnership could optimize its own processes, investment choices and patient flows, only to create a suboptimal result for the hospital as a whole. On the flip side, medical specialists have the vision and expertise to improve the quality of care, but they were not in the position to make overarching decisions, as these were made by administrative managers.

Therefore, the hospital management and medical staff decided that the medical specialists, became employees of the hospital, acquired strategic and operational responsibility and became shareholders of the hospital. Employment contributed to the elimination of the production mode (volume incentive) necessary to guarantee the medical specialists' income. In addition, medical doctors were promoted into the management of the hospital. With the slogan 'doctor in the lead', medical managers obtained full operational responsibility for the 4 business units and 2 medical directors were appointed in the board of directors.

By giving doctors operational responsibility, they had the power to improve the quality of care on a systematic level. Educating doctors and putting them in the manager's shoes should improve the mutual understanding and collaboration of doctors and managers and result in a growing number of leaders within the organization. By using an alternate system, every 4 year changing turns, a growing number of medical specialists would possess business acumen in the future. All medical specialists with a managerial role also still provided care in 50% of their time, to ensure their close relationship with medical staff and having many touch points with the work floor that could give them feedback on the effect of their leadership and decisions.

Finally, as shareholders, the medical specialists have a stake in the collective success of the hospital and not just their own department. The hospital is the first and only hospital in the Netherlands with such a "participatory model" and had to change its grounds from a foundation to a private company to enable medical specialists to trade their goodwill for convertible bonds.

6. Results

The first challenge in evaluating the impact of 'Dream' that it has been a holistic approach with multiple interventions. There is limited, albeit some, opportunity to address impact to specific interventions. Therefore, we evaluated the total impact on the hospital. The second challenge is how to measure quality. Quality is not simple and static, but is a complex and moral concept [20]. Outcome measures alone do not capture the full quality perspective, and are in any case disease specific. It is a notorious complicated issue, especially if we take a holistic view on a heterogeneous patient population. In addition, Bernhoven used a concept of quality that focused on eliminating care that did not offer quality or even provided harm. The hospital decided to be more open and forthcoming about the limitation of medical knowledge and share potential upside and downside of treatments as well as the uncertainties with the patient. Acknowledging those limitations will improve quality as many studies on shared decision making suggest. Overall quality metrics that correctly capture these outcomes are difficult to define.

The concerted efforts of the contract innovation and business model innovation enabled providing better care at lower costs. Within 1 year, the burden of claims of the hospital dropped 7%, increasing to 12% after 2 years and 16% after 3 years. These results surpassed the initial expectations of the hospital (which was based on 10% reduction of claims after 5 years). A vast part of the reductions was realized by the employee's bottom-up initiatives. This reduction was achieved while the national benchmark on claim expenses of hospitals (Logex) showed that the Bernhoven expenses before the change were below average for all specialties except for cardiology (data not shown) and even though number of unique patients treated in the hospital increased with 3%. Selected examples of quality initiatives and their impact on volumes:

- 24/7 presence of a team of medical specialists in the acute care unit reduced the overall % of patients that are admitted to the acute ward with 21.5% (10.6%) (Fig. 2).
- An optometric screening centre for patient referred to eye specialists reduced the number of patients that actually had to be seen by an eye specialist by 60%.

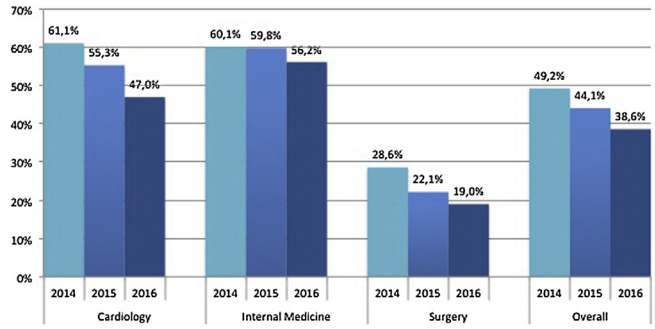

Fig. 2. Reduction in percentage of patients that were admitted to the acute ward after being referred to the acute care unit by GPs.

- Dermatologists started visiting selected general practitioner's offices to provide consultations there for patients and their GP's which resulted in 87% of patients not requiring an actual hospital referral and a learning experience for the GPs.

Bernhoven and its insurers have a governance structure in place to share and discuss results and lessons learned. In quarterly meetings, the hospital shares results and impact per quality initiative and the insurers overlay their data to establish that volumes do no decline because patients go to surrounding hospitals (i.e. costs go up somewhere else).

In terms of patient satisfaction, the quality of care improved as evidenced by patient ratings and recommendation scores. In 2014, the hospital scored a 8,4 with 77% of recommending the hospital to others. In 2018, the hospital scores a 8,6 with a recommendation score of 93%. Moreover, in 2014, 2016 and 2017, the hospital received the Dutch national patient hospitality award. In terms of patient outcome, the Hospital Specific Mortality Rate (HSMR) of Bernhoven as calculated by the Central Bureau of statistics national bureau is in line with the national average. For the period 2015–2017 the HSMR was 106 (95% CI: 100–113); for 2017 the score was 102 (95% CI 91–114) [21].

7. Current challenges and future perspectives

The Bernhoven transformation provides clear indications that it is possible to provide better care (as experienced by patients) with lower volumes (16% lower DRG claims after 3 years) and provides valuable lessons for further healthcare reform. There remain three key questions to be addressed.

The first question is to what extend the reduction in burden of claims can be translated into a reduction of the hospital cost structure. In the first 2 years, the transformation required a financial investment from the insurer to create the change. In the third year, the hospital has been systematically working to reduce the cost base. In the period 2014–2017, the costs have been reduced according to the business case, except for the increase in salaries in the sector, which was higher than expected. As expected, material costs have decreased in line with the decrease in claims. In 2017 the hospital launched a cost saving initiative and reduced 130 FTE as a result of the reorganization. In the physician staff there was a substantial adjustment of the mix between different departments and a shift from medical (sub)-specialist to more generalists (e.g. hospitalists). Going forward, the question is how much further the cost base can be reduced, while keeping enough time and financial leeway to continue to invest in quality.

The second question is how insurers will have to contract and finance the hospital after the current 5-year contract. What new mechanism would have to be put in place to balance incentives for appropriateness and efficiency? The hospital and the insurers are investigating ways to use different contracting models for each business unit (e.g. pay for more time for the patient in the decision making unit, a fixed budget for acute care, subscription fee for chronic care, bundled payment for the intervention unit).

The third question is how to effectively scale up the lessons learned from the Bernhoven transformation to other hospitals. In order to do this, health insurer VGZ has established a consortium of 9 hospitals that follow a similar path to share learnings and best practices. Together and with new contracting strategies this consortium aims to take away institutional hurdles for an agenda that aims at combining better and appropriate care and lower cost [22]. In addition, The Bernhoven transformation allows insurers to get a beyond-the-surface understanding of practice variation and creates a new benchmark that is based on quality initiatives of professionals. In the care contracting with other hospitals, insurers have now a professional-backed indication of how much care could be unnecessary. VGZ has actively used to quality initiatives in its care contracting to contract less health care at other hospitals.

8. Conclusions

A long-term collaborative approach between hospitals and health care insurers with the right incentives and preconditions in place can bring about significant cost reductions by focusing on quality improvement. Appropriateness of care and patient centered organization of care played a central role in quality driven cost reductions. This successful initiative is currently extrapolated to 9 other hospitals, contributing to the continued accessibility and affordability of health care.

Conflict of interest

All authors, except for NvL have been part of the Bernhoven transformation.

PB: part of the transformation as chairman of the board of the Bernhoven Hospital.

MO: part of the transformation as consultant of Strategy&.

SV: part of the transformation as consultant of Strategy&.

AK: part of the transformation as member of the board of VGZ, one of the involved insurance companies.

JK: part of the transformation as strategic advisor.

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