

# Establishing a pain management program in cardiology: what we can learn from social marketing and normalization process theory

## Implementation of pain management in cardiology

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### Research article

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# **Abstract**

## Background

We analyzed how a pain management program (PMP) in a cardiology department of a high-volume center was implemented into daily practice. The results provide some very valuable insights into the dynamics of complex professional behavioral changes, including the barriers to and facilitators of such changes.

## Methodology

The behavioral dynamics during the implementation of the PMP were analyzed using normalization process theory (NPT) because NPT reflects both individual and collective contributions. NPT elements were then studied in their relation to social marketing tools, especially the Cochrane Effective Practice and Organization of Care (EPOC) taxonomy. Where the EPOC tools did not wholly reflect the scope of the PMP, further marketing concepts were introduced.

## Results

The frameworks used provided a useful structure to analyze the behavior change intervention, yielding insights into significant aspects of the change process (such as barriers and facilitators) at the level of the individual, within groups, and across the organization. By also integrating EPOC with NPT, we show how improvements in PMP tangibility can aid communication between PMP leaders and project participants. We also show how value can be co-created between the two groups.

## Conclusion

Hospitals represent complex environments where effective behavior modification requires changes at many different levels. Nevertheless, we demonstrated, using NPT and the incorporation and adaptation of social marketing/EPOC tools, that an intervention designed to change behavior could succeed even in such extreme conditions.

# **Background**

Pain is both disabling for patients and can add to the costs incurred by health service providers (1). There is considerable literature dealing with pain management, ranging from pediatric (2) and geriatric care (3), to the managerial issues involved with pain management programs (4). Specifically, the use of pain management guidelines for healthcare workers has been examined (5), as well as communications about pain management with patients following post-operative cardiac surgery (6). Establishing a pain management program (PMP) in a cardiology/electrophysiology (EP) department might seem unnecessary at first glance because interventions are regarded as minimally invasive (7, 8). However, even minor operations/interventions, such as percutaneous cardiac ablative procedures for atrial fibrillation/ventricular tachycardia followed by bed rest can result in back pain, while implants of pacemakers or cardiac defibrillators via incisions can result in unexpectedly high levels of post-operative pain if not adequately treated (7, 9). The number of these interventions is rising (10). Therefore, pain management has "value" for both patients and hospital staff, although the latter may not always consider this to be the case (11). Patient welfare is crucial, and the hospital's economic well-being and reputation have to be considered.

Although the effect of the PMP was demonstrated by Dorschner et al. (8), it is less evident which group dynamics, facilitators, and barriers project leaders were confronted with during the implementation of the PMP, a behavior change intervention. The objective of this follow-on study was to retrospectively analyze how a PMP was implemented in an EP department treating 3000 patients annually. Our analysis used Normalization Process Theory (NPT) and social marketing tools. Even though this was a retrospective analysis, our results can help future leaders successfully implement similar programs.

## Circumstances leading up to the PMP

Here we report on the program's implementation in the EP department. This department deals with patients with arrhythmias and requiring interventional therapy (ablation procedures for atrial fibrillation, ventricular tachycardia, etc.; cardiac implants like pacemakers and cardioverter defibrillators). The EP department staff who participated in implementing this program were 45 nurses and 20 doctors.

In line with the market-oriented (12) ethos of its founders, the heart center that participated in the present study is a tertiary center specialized in cardiology, EP, heart surgery, and pediatric cardiology. The center also has a cultural emphasis on research into patient

needs and highly efficient workflows with specialized divisions. Therefore, quality and workflow improvements together with high-level clinical performance play fundamental roles. While quality improvement measures in pain management were targeted for the whole center, this paper only deals with the PMP in the EP department.

A prospective consultant (first author, BK) was put in charge by the EP's departmental chief to enable certification on pain management for the cardiac EP department, and became part of an existing multidisciplinary team consisting of an anesthetist, a pain nurse, one doctor from every department, the head of quality management, and the head of nursing. The direct stakeholders were doctors, nurses, and patients. The hospital administration could be regarded as an indirect stakeholder. Prior to the implementation of the structured PMP, an initial assessment took place in all departments. The EP department among the other departments had been evaluated by a certification organization but was not actively involved in preparations beforehand. The first author (BK) was confronted with results from that assessment (quality targets for all departments had been missed) and presented them to the EP department. Initially, the senior physicians (opinion leaders) within the EP department shared the sentiment that "we do excellent work and there is no need for pain management". They questioned the methodology and the results of the certification organization's initial assessment, and also questioned the recommendation of a PMP. In contrast, nurses said that patients complained of moderate to severe pain after procedures. To overcome the initial resistance among senior physicians, the PMP leader of the EP department (first author, BK) carried out an additional survey on the ward, interviewing more patients than included in the first assessment to better investigate patients' needs. This survey indicated a high prevalence of post-operative pain (7).

These new results fulfilled several important requirements of the project: the results (1) provided data to legitimize the improvement process in the minds of the physicians (nurses and patients never questioned this); (2) made doctors aware of the problem; (3) provided the local consensus required to proceed with implementing the PMP; (4) revealed barriers to effective pain management from the perspective of doctors, nurses, and patients; and (5) identified appropriate steps that could be taken by nurses and doctors working together to benefit patients. The developed pain management policy underpinning this program was outlined by Bode et al. (7).

#### Analysis of the implementation of the PMP in the light of NPT and social marketing tools

Embedding complex interventions in complex settings requires collective action (13) rather than individual behaviors. NPT deals with behaviors associated with implementing a new or modified way of conceptualizing, enacting, or organizing a practice. Such change includes the collective action that results from complex patterns of social relations and interactions (14, 15). Additionally, social marketing tools can help to implement NPT. Such tools are categorized and defined by the methodological program of the Cochrane Effective Practice and Organization of Care (EPOC) Review Group (16). This innovative framework facilitates comparison of research on behavior change interventions.

#### Normalization Process Theory

NPT is a conceptual framework (17) designed to assist in understanding and explaining dynamic processes involved in normalizing an innovation and making a complex intervention routine in terms of the actions of actors at the organization level (15, 18).

This theory, using a content-specific approach (19), deals with implementing practices, making them routine, and embedding them into social contexts (14); such efforts may improve sustainability (20), and the new behavior become part of the culture of the organization (21). Unlike processes that focus on change at the individual level, NPT addresses the roles of both individuals and groups. Its use has been justified since it recognizes the realities of implementation (22). NPT was chosen for this investigation because it provides a whole-system analysis including different stakeholders. NPT has been used to explain the implementation of multiple behavior change programs into practice (23), but not, to the best of our knowledge, in regards to a post-operative PMP in a hospital environment.

NPT focuses on four theoretical constructs that characterize mechanisms energized by participants' investments (14) and reflect their agentic contributions (17):

1. Coherence: "Processes of individual and communal sense-making that promote or inhibit the coherence of a complex intervention to its users. These processes are driven by investments of meaning made by participants."
2. Cognitive participation: "Processes of cognitive participation that promote or inhibit users' enrolment and legitimization of a complex intervention. These processes are driven by investments of commitment made by participants."
3. Collective action: "Processes of collective action that promote or inhibit the enacting of a complex intervention by its users. These processes are driven by investments of effort made by participants."

4. Reflexive monitoring: "Processes of individual and communal reflexive monitoring that promote or inhibit users' comprehension of the effects of a complex intervention. These processes are driven by investments in appraisal made by participants."

Within each construct, four components characterize people's behavior. Norms (notions of how beliefs, behaviors, and actions should be accomplished) and conventions (how beliefs, behaviors, and actions are practically accomplished) are underlying operations to constrain or release NPT mechanisms (14), and they help design culturally acceptable interventions (24). Knowledge of NPT helps us to understand the "contexts, social structure and processes through which behavior change interventions are enacted" (13).

## Methods

This research was a retrospective evaluation of the elements involved in the implementation of the PMP.

The first author (BK), employed at the EP department, undertook the intervention being reported here and kept a record of the process. The creation of various materials, such as questionnaires and information documentation for practitioners, enabled the project lead to crystallize the findings at different stages of the project and to recall the process at the evaluation stage (25). Recall was aided by the project leader's ethnographic means of capturing data through her involvement in small discussion groups and one-to-one meetings for collecting and disseminating information amongst medical and nursing staff.

This approach led to an initial coding of the data using the NPT framework. We adapted our methods from previous research (26–29). A cross-comparison (30) of the results obtained by the fifth author (HA) led to an examination of each of the stages of the implementation process and how these could relate to the NPT framework (27). We also used the NPT framework as the basis for questioning the first author (BK) in order to ensure that all experiences had been exhaustively captured. We used methodology similar to that presented in the literature (28, 29). This helped to clarify issues related to the work that was involved in implementing the PMP.

The EPOC framework (16) was used for coding the data in terms of a broad framework of behavioral, regulatory, and organizational interventions; this framework included tools that could be related to social marketing principles (31). Further marketing concepts were introduced where the EPOC tools did not fully reflect the nature of the tasks being undertaken.

### Analysis

This section consists of two parts. Part A presents tables detailing the processes categorized within the NPT and EPOC framework. We believe that the comprehensive structure of the NPT framework can be displayed more understandably in tables than within text. Part B focuses on the analysis of the utilized social marketing concepts in context with the barriers and facilitators to implement the PMP. Additionally, we discuss some of the existing literature.

Part A: Table 1 illustrates the program's relevance to the NPT framework. Table 1 also displays the concepts from the EPOC framework that were useful during the different stages of leadership and focused on professional, organizational, structural, and patient-oriented levels.

Table 2 illustrates how aspects of the program could be categorized using the NPT framework.

Table 1

NPT elements relevant to the program, and the involved EPOC and social marketing tools.

NPT group	NPT element	Relevance to this project	EPOC and social marketing tools
Coherence/Sense-making	Differentiation (Participants distinguish the intervention from current way of working.)	<p>Initially, the senior physicians (opinion leaders) questioned the results of the certification organization's initial assessment and the need for a pain management program. They expressed that "we do excellent work and there is no need for pain management". In contrast, nurses said that patients complained of moderate to severe pain after procedures. To overcome the initial resistance among senior physicians, the project leader carried out a survey to investigate patients' needs. This survey indicated a high prevalence of post-operative pain.</p> <p>After the implementation of this initiative, nurses and doctors will have a structured approach to pain management, whereas previously, pain management did not play a crucial role and depended on doctors' and nurses' knowledge, enthusiasm for pain management, and patient's active request for painkillers.</p>	<p>(PI) Marketing (Research) We adapt the EPOC term "marketing" and consider "marketing research" as the process of finding out the needs and wants of different stakeholder groups. The revised term emphasizes the importance of this preliminary stage.</p> <p>(POI) Presence and functioning of adequate mechanisms for dealing with patients' suggestions and complaints</p> <p>In this initiative the survey to elicit patient opinion helped justify the intervention.</p>
	Communal specification (Participants collectively agree about the purpose of the intervention.)	<p>We presented the idea to establish a PMP due to obtaining bad results from a pre-certification survey during noon rounds, during which junior and senior doctors meet to discuss patients and the clinic.</p>	<p>(PI) Local opinion leaders (Use of providers nominated by their colleagues as "educationally influential".)</p> <p>The opinions of senior medical staff carried legitimacy and credibility, and had to be recognized.</p>
	Individual specification (Participants understand what the intervention requires of them.)	<p>Every doctor in the department received a red letter (carton board) with take-home messages and KB's telephone number in case of questions. Doctors were also given a pocket card with the pain assessment scale on one side and a list of World Health Organization painkillers adopted by the hospital on the other side.</p> <p>Doctors and nurses were educated separately to address their different needs and expectations.</p> <p>Educational materials (Power Point presentations) were delivered to every staff member via email after the educational seminars.</p>	<p>(PI) Reminders (The patient or provider encounters specific information designed or intended to prompt a health professional to recall information or perform or avoid some action to aid individual patient care.)</p> <p>The reminders were all materials that were used to aid recall of actions related to the intervention. Segmentation (52)</p> <p>This is a standard marketing concept but does not appear in the EPOC list. It refers to the recognition of differences in the needs of different stakeholder groups.</p> <p>(PI) Distribution of educational material</p> <p>This was effective given the communication needs that had to be addressed.</p>

Specific terms are given in bold, and explanations are presented in italics if necessary. OI organizational intervention, PI professional intervention, POI patient-oriented intervention, SI structural intervention

NPT group	NPT element	Relevance to this project	EPOC and social marketing tools
	Internalization (Participants assign value to the intervention for their work.)	Because the program makes life easier for doctors and nurses there are no specific resources necessary. Uncordinated actions before implementation of the program provoke time delays in regard to pain level assessment and administration of painkillers to the patients. These delays could be minimized by structured pain level assessment and giving prescription medications the evening before the intervention.	(SI) Changes in scope and nature of benefits and services. The benefits that stakeholders derived from the behavior change had to be recognized in order to demonstrate the value of behavior change, especially since there were costs (time needed for regular pain assessment and medication prescription) associated with the intervention.
Cognitive participation	Initiation (Key individuals drive the intervention forward.)	A pain nurse was employed by the Dept. of Anesthesiology, and she was in contact with an anesthesiologist who was also in charge of the PMP. They wanted to establish better practice in the Dept. of Cardiac Surgery and then roll it out for the whole heart center. The management of the heart center was interested in achieving certification as a center of qualified pain management. Therefore, a task force composed of a pain nurse, the anesthesiologist, one doctor from every department, the head of quality management, and the head of nursing was founded. They organized meetings, and managed the development of SOPs	(OI) Clinical multidisciplinary teams (Creation of a new team of health professionals of different disciplines, or additions of new members to the team. Team members work together to care for patients.)
	Enrolment (Participants agree that the intervention should be part of their work.)	Senior management created the pain nurse position. This was not a position in the hospital prior the intervention.	(PI) Local opinion leaders + (OI) Skill mix changes Buy-in from the opinion leaders enabled the provision of a useful resource, specifically the addition of skillsets available for the project.
	Legitimation (Participants buy into the intervention, and believe it is right for them to be involved and that they can make a valid contribution to it.)	This was the first time that the heart center applied for certification, and initial certification was received ten months after the first assessment. The certifying organization had certified other hospitals in pain management, and they provide a basis for comparison. The organization is known in its field but was not known among hospital staff except for the anesthesiologist and the pain nurse. As the project progressed, staff became more familiar with the organization. Hospital staff did not question the background of the organization. KB presented suggestions about pain management to the staff, and invited them to develop these ideas further. This feedback was used to adapt our program.	(SI) Presence and organization of quality monitoring mechanisms Knowledge about the certification process motivated the staff to engage in this project. (PI) Local consensus process Participants were included in discussions to ensure that they agree that the clinical problem was important and that the approach to manage the problem was appropriate. Their contribution both prior to and during the program indicates "co-creation".

Specific terms are given in bold, and explanations are presented in italics if necessary. OI organizational intervention, PI professional intervention, POI patient-oriented intervention, SI structural intervention

NPT group	NPT element	Relevance to this project	EPOC and social marketing tools
Collective action	Interactional workability (Participants perform the tasks required by the intervention.)	Nurses and doctors go through patients' folders every evening and should be able to complete missing information about drug prescriptions (nurses can remind doctors if doctors forget this).	(SI) Staff organization (OI) Formal integration of services (Bringing together services across sectors or teams, or the organization of services to bring all services together at one time; this is also sometimes called "seamless care"). The process adopted in this intervention resulted in patient care becoming more seamless.
	Relational integration (Participants maintain their trust in each other's work and expertise throughout the intervention.)	Nurses and doctors work in a very complex environment. They are confronted with significant and taxing administrative duties while participating in quality improvement measures. Pain management requires teamwork. We argued that asking a short question about a patient's pain level costs only a few seconds while the gain is relatively large and should improve treatment quality and prevent further pain.	Establishment of value for the different stakeholders Asking short questions helped to reduce a perceived cost (time) and thus improve value for one group of stakeholders.
	Skillset workability (The tasks of the intervention are appropriately allocated to participants.)	The clinicians are advised to (1) pay closer attention to the continuation of current pain medication, (2) prescribe complete recommended doses of painkillers, (3) inform patients on all given pain medications. Nurses are advised to ask patients about their pain intensity after interventions with the help of a numeric rating scale every two hours on the day of procedure (they already checked wounds and foot pulses in these intervals). Nurses also evaluate and document pain intensity at least every 12 h.	(PI) Educational seminars and SOP; distribution of educational material. Helps improve the tangibility of the change required. (PI) Patient-mediated intervention (New clinical information (not previously available) collected directly from patients and given to the provider.)
	Contextual integration (The intervention is adequately supported by the host organization.)	Audits were performed annually (two internal, one external) to assess the adoption of the policy, provide feedback, and discuss emerging problems with staff.	(PI) Audit and feedback (Any summary of clinical performance of health care over a specified period of time.)
Reflexive monitoring	Systemization (Participants access information about the effects of the intervention.)	The hospital achieved certification (external audit) on structured pain management complying with the requirements of the certification organization.	(SI) Ownership, accreditation, and affiliation status of hospitals and other facilities
	Communal appraisal (Participants collectively assess the intervention as worthwhile.)	Results of the last certification were presented as a collective achievement. People can see the certificates because they are pinned on the hospital's walls.	(POI) Provider satisfaction of work conditions and the material and mental rewards (e.g., interventions to "boost morale")

Specific terms are given in bold, and explanations are presented in italics if necessary. OI organizational intervention, PI professional intervention, POI patient-oriented intervention, SI structural intervention

NPT group	NPT element	Relevance to this project	EPOC and social marketing tools
Other		Patients received structured information in the form of educational material. In addition, oral explanations were provided by nurses and doctors. These included descriptions of the pain measurements and treatment methods. The staff also emphasized that patients should disclose any pain they experienced.	Mass media in the form of leaflets; marketing via word-of-mouth with linear marketer influence model (53); oral reminders.
Specific terms are given in bold, and explanations are presented in italics if necessary. OI organizational intervention, PI professional intervention, POI patient-oriented intervention, SI structural intervention			

Table 2 illustrates how aspects of the program could be categorized using the NPT framework.

Table 2  
Codes identified and their relation to NPT elements

Coherence (sense-making work)	Cognitive participation (relationship work)	Collective action (enacting work)	Reflexive monitoring (appraisal work)
Differentiation 1. Understanding the patient's need 2. Understanding the significance of the need 3. Gauging changes in practice that may be required	Initiation 1. Inter-departmental co-ordination via taskforce 2. Role of certification – aligning staff motivation 3. Implications of certification – project execution 4. Educational seminars	Interactional workability 1. Dialogue with patients encouraged 2. Pain levels to be measured 3. Monitoring patient folders 4. Dialogue between patients and doctors/nurses – therapy escalation	Systemization 1. Internal appraisal 2. Dialogue with heads of department
Communal specification 1. Interaction with (multidisciplinary) colleagues 2. This interaction enables a shared understanding of the internal processes that may contribute to the problem 3. Engagement with stakeholders and recording of responses based on their salience 4. Assessments of existing evaluation and appraisal of the analysis undertaken	Enrolment 1. Project leader's personal communications with others 2. Taskforce membership criteria 3. Role of senior management in determining taskforce membership	Relational integration 1. Regular educational seminars 2. New questions to be asked of patients 3. Staff to ask project leader in case of questions	Communal appraisal 1. Certification achieved
Individual specification 1. Communication tools and materials used to help people understand their roles and tasks 2. Feedback on staff performance 3. Assessments of existing evaluation and appraisal of the analysis undertaken	Legitimation 1. Dialogue about issues with current plans 2. Reference to certification to get legitimacy	Skillset workability 1. Allocation of tasks according to the SOP 2. Nurses need a little more time (connected to workload appraisal)	Individual appraisal 1. Informal discussions 2. Workload issues
Internalization 1. Communicating and eliciting feedback on survey results, individual tasks, and workflows with internal audiences 2. Establishing practitioner self-confidence 3. Usage of communication materials (e.g., pocket cards) to facilitate internalization 4. Distinguish internalization issues between the project leader and those of others involved in the project	Activation 1. Development of an SOP document to structure responsibilities and tasks	Contextual integration 1. No specific resources needed 2. Pain nurse is paid for by the hospital 3. Need a combination of teaching and control by project lead to maintain compliance	Reconfiguration 1. Assessments of existing evaluation and appraisal of the analysis undertaken

Part B: Social marketing tools and broader marketing concepts can complement the use of NPT. The use of empirical data helped to convince senior managers of the value of the initiative (32). During the educational seminars, the marketing concept of exchange (33) played a role. The "get" notion of marketing (34) identifies value as being the difference between the benefits received by a party to an exchange less the costs that they incur. For patients, value would be the benefit of less pain but the cost would be their having to provide

more personal information to nurses. For nurses, the costs would be having to invest slightly more time asking patients about their pain level and documenting this in the patient folder (35–37).

In a previous study, nurses identified the lack of possibility of consulting a clinical pharmacist about pain management (38) as a barrier to effective pain management. Furthermore, van Valen et al. (39) revised their pain management protocols so that nurses did not need to consult a physician. Our policy required doctors to invest time and effort in prescribing pain killers on demand, but then nurses had the autonomy to administer these painkillers according to the needs of patients within a defined boundary without requiring further consultation with doctors. The benefits gained by nurses and doctors as a result of patients feeling lower levels of pain are patients' thankfulness (40), patients' satisfaction, good reputation of hospitals, and self-fulfillment of staff (41).

Because the project leader of the PMP at the EP department could not offer monetary benefits to colleagues to adopt the new protocol, the following benefits were stressed. Firstly, adequate pain management is an ethical concern and is a fundamental requirement for faster recovery and improved patient satisfaction. Patient satisfaction is important because it influences future decisions related to the likelihood of seeking healthcare for a specific procedure at a particular institution (42). In addition, early pain assessment and treatment reduces patients' complaints and dissatisfaction (8). In turn, patient dissatisfaction will stress staff and thereby reduce job satisfaction. The educational seminars helped develop a proposal for a standard operating procedure (SOP) protocol. Doctors and nurses can incorporate their own ideas into the procedure on an ongoing basis, which means that the value they derive from the new process would accrue not just when the new procedure is implemented but over time (43). This illustrates a co-creation of value.

Our analysis of the data adds to the EPOC framework by including two additional concepts that help explain the effectiveness of certain marketing tools. The first is "tangibility" (44) because a professional's ability to define or describe the process (the generality dimension of tangibility) (45) will aid their understanding of its attributes and potential value. The usage of booklets and a statement of the processes to be followed are examples of improving the generality dimension of tangibility. In addition, there are, of course, instances where it is not possible to achieve tangibility and the people promoting the behavior change activity can only offer something intangible, i.e., what changes are involved (along with the costs and benefits) will only become obvious sometime in the future (46). In such instances the change agent has to resort to making promises, and in order for these promises to be believed, the audience has to trust the change agent and/or other aspects of the program. This requires credibility, which is the second new construct presented in the table.

Figure 1 shows the marketing concept related to the implementation of the PMP.

Marketing research is undertaken first in order to establish the needs and wants of key stakeholder groups. This research also helps to identify key groups of health professionals that are targets for the PMP, and helps determine the value derived in practice. This leads to the definition of the actual behavior change program (product/service). In the course of this PMP, we identify two important aspects. The first is the level of (in)tangibility of what people are being asked to do. The more intangible the intervention is, the lower the possible clarity of the change expected of participants (45). The second important feature is the extent to which co-creation takes place, which enables participants to derive greater value from behavioral changes throughout the intervention, for example, by sharing ideas about best practice. This can be achieved via word-of-mouth.

## Discussion

Analysis of behavior change interventions with the help of NPT and EPOC has been reported at the population (47) and organizational (48) levels. NPT is a sociological theory that helps us understand implementation, embedding, and integration of innovation in health care settings (49). The present paper provides additional insights. The aim of this managerial appraisal of behavior change intervention is to reveal its dynamics as well as the barriers to and facilitators of change. This helps doctors lead change in a complex environment. The specific context used here is the establishment of a PMP.

In contrast to other NPT analyses, we used a participatory approach. The weaknesses associated with participatory approaches include such approaches being routinized, insensitive, and unimaginative. In addition, while quantitative approaches may use before and after measurements in order to identify causality, this is not possible with participatory approaches. In order to address this issue, it is the very participants in the process who may be charged with identifying issues of cause and effect because of their familiarity with the processes and outcomes (25). This study focuses on cause and effect issues related to the NPT elements dealing with "communal specification" and "individual appraisal" of cause and effect. Moreover, the usage of qualitative approaches becomes essential when dealing with relatively small samples of people, as is the case when implementing a practice among a small group of professionals.

There are advantages to the approach used here, which can be described as studying an organization from the shadow or hidden side of the organization (25). This is particularly the case for issues whose existence may not always be obvious to outsiders (50).

During the data coding process, we experienced some difficulties in assigning some data to an NPT element as described by other researchers (51). This can be regarded as a weakness of the NPT framework. However, NPT constructs are intended to work together to explain a causal mechanism. Due to the dynamic nature of implementation processes, it seems unrealistic to assume that one theory can cover all aspects of such processes. Nevertheless, NPT allows fluidity and flexibility during coding, and analysis needs to consider the specific context (23). We analyzed the implementation of a PMP from a retrospective perspective, and we could demonstrate that NPT has the opportunity to analyze implementation processes in complex settings with different stakeholders. Therefore, we can assume that there is also potential to shape future implementation journeys by using NPT as a prospective tool to plan implementation projects.

#### Ongoing managerial challenges

Maintaining compliance from medical staff requires ongoing efforts. New and existing staff require training and motivation in order to process the NPT stages. The heart center involved in this study, like most university facilities, faces the challenge of considerable turnover among ward doctors and nurses. However, with our implementation strategy, the effects of this quality improvement measure (PMP) were persistent, as reinforced by the investigation by (8).

## Conclusions

Implementing change is challenging. Nevertheless, we demonstrated, using NPT and the incorporation and adaptation of social marketing/EPOC tools, that an intervention designed to change behavior could succeed. Furthermore, concepts drawn from the marketing discipline can help provide further insights into improving acceptability of an intervention. Specifically, the notions of tangibility and co-creation can help instigators of change focus on making the processes and outcomes of change clearer to relevant stakeholders.

#### Declarations:

Ethics approval and consent to participate

not applicable

Consent for publication

not applicable

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

#### Competing interests:

The authors declare that they have no competing interests.

## List Of Abbreviations

EP Electrophysiology

EPOC Cochrane Effective Practice and Organization of Care

NPT Normalization Process Theory

PMP Pain Management Program

SOP Standard operating procedure

## Declarations

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**Competing interests:** The authors declare that they have no competing interests.

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## Figures

## Marketing Research

Early stages involve background research



## Segmentation

Identification of key stakeholders in the exchange relationship



## Value

Establishing value for the different stakeholders

$$\text{Value} = \text{benefits} - \text{costs}$$



## Product / Service

Definition of the behavior change with implications for benefits and costs



## (In)tangibility

Extent to which the program relies on tangible materials (to improve benefits) or intangible promises of future benefits

## Co-creation

Involves greater empowerment of staff to contribute to the way value is configured and derived from the project

## Word-of-mouth

Such communications between staff members facilitate co-creation and the credibility of communications

## Credibility

The greater the reliance on intangibility, the greater the role of credibility in communications

Figure 1

The social marketing concept involved in the implementation of the behavior change intervention