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Compensation and Incentives in Medical Networks with Gate-keeping and Case Management

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Abstract

New approaches in health care, such as e.g. Integrated Delivery Systems, affect the role and tasks of medical suppliers. More and more, medical suppliers are incorporated into the process of guiding patients to medical specialists and hospitals and thus managing the course of disease. In this context, the role of medical gate-keepers and case managers may provide opportunities for undesirable behavior (from the network's point of view). Therefore, compensation-induced incentives for gatekeepers and case managers are in the main focus of the paper. Different health care payment systems and the impact of financial and non-financial incentives on case managers and gate-keepers in medical networks are analyzed. Another focus is laid on medical suppliers that are not involved in managing diseases and guiding patients. Due to their smaller margin of actions and possibilities to take advantage of it, reimbursement should emphasize different aspects than for case managers.

JEL Classification: I11, J33, L22

1 Introduction

The modern industrial society requires changes in the health care systems. Ageing societies due to demographic changes challenge the established health care institutions since the medically cost-intensive stage of life is expanded. Additionally, more sophisticated yet more expensive medical therapies are available due to pronounced medical research. In many cases, these new therapies are not curative but only substantive and life-prolonging. Furthermore, changed disease patterns oblige therapies that require a coordination of different medical suppliers.

Integrated Delivery Systems (IDS) and medical networks in health care address these issues and should guarantee a holistic, sound and economically efficient medical supply by implementing novel organisational and managerial approaches. Physicians, hospitals and other medical suppliers organize in networks and, thus, synergies due to information exchange and interdisciplinary can be exploited. The process of medical treatment should be coordinated and medical care requiring more than one medical supplier should be guided. It has often been argued that the management and coordination of patients in the health care sector should be done by gate-keepers, case managers and disease management programs. Those methods of guiding patients through the medical care process and integrating health care have been in the focus of many papers on health care delivery systems. Schneider et al. (2004) examine the primary care case management und argue that quality of primary care case management is much less reviewed than the quality of other health plans. Burns/Pauly (2002) analyze typical mistakes made so far in integrating health care and make suggestions on how to improve the process of integration. Among other things, they point out that the coexistence of disease and case management can generate a more efficient health care. However, an incentive compatible compensation scheme is important in every health care delivery system in order to obtain a quality and cost effective medical care. E.g., Hellinger (1996) compares several empirical studies on health plans and points out that financial incentives are the key to reduce utilization of medical services in health care networks.

In the medical sector many different reimbursement schemes have developed over time. One could divide those different schemes in prospective and cost based compensation schemes. Both methods implicate objectionable incentives, e.g. the fee for service compensation which is traditional in the German health care sector induces medical suppliers to provide more treatments than necessary. In the health economics literature different reimbursement schemes for medical suppliers have been widely discussed. Newhouse (1996) identifies a trade-off between efficiency and selection, i.e. the more a compensation scheme evokes efficient treatment the more the suppliers are induced to pursue risk selection. Ellis (1998) classifies three unwanted incentives of reimbursement schemes namely risk-type conditioned amount of service which he refers to as creaming, undersupply (skimping) and dumping of patients. He finds that prospectively compensated providers will pursue creaming, dumping and skimping while cost-based reimbursement results in an overprovision of services to all patients. Ma (1994) discusses cost and quality incentives of different reimbursement schemes and obtains optimal reimbursement for the case with and without discrimination of patients possible. Iversen/Luras (2000) find empirical evidence that capitated general practitioners refer patients more often to a specialist. Ma/McGuire (2002) model the impact of network incentives. Yet, they model these incentives independent of the initial provider reimbursement. Shortell et al. (1994) examine organizational structures of Integrated Delivery Systems. They regard the varying and often contradictory financial incentives as a main barrier to implementation of IDS. They emphasize the necessity of an authority that organizes the guidance of patients.

In the present paper, a medical network is examined where some gate-keepers and case managers can guide patients by deciding on whether or not to refer them. In particular, the impact of different reimbursement schemes on medical suppliers who can abuse their authorization to refer patients is examined. A special focus is laid on how the compensation influences the coordination of medical services and thus the optimal health care process.

Different possibilities of mitigating unwanted incentives from the compensation are discussed.

Fee for service, fixed income (salary), fee per admission and DRG lump compensation and capitation are the considered compensation methods. A performance related compensation proportion of reimbursement is also in the focus since incentivization can be done quite exactly by such a component. These reimbursement schemes are the most prevalent ways of compensating medical suppliers.

This paper contributes to the existing literature because it provides a systematic analysis of possible compensation schemes in medical networks with gate-keeping and case management. Moreover, the expanded margin of gate-keepers and case managers in medical networks is analyzed. These medical suppliers can use this margin to refer patients they do not want to treat for financial reasons – depending on the adopted compensation of the gatekeepers and case managers. In the focus of the examination is a medical supplier who treats patients but also decides on the treatment of his patients from other medical suppliers by referring them. In the lack of a better term this medical supplier is referred to as a case manager. Yet, unlike in cases where e.g. nurses are case managers, this medical supplier can decide on treatments independently. In addition, he has bargaining power when negotiating with other medical suppliers because the case manager decides on the care process. The case manager is a gate-keeper at the same time because it is assumed that patients must consult their case manager first except of in cases of emergencies. In particular, the discussion in the German-speaking community on how to improve medical care in terms of quality and cost reduction emphasizes the necessity of a medical supplier guiding patients stringently and explicitly through the medical care process. For example, Erlinghagen/ Pihl (2005) analyze the impact of having a family doctor who can naturally take the position of a case manager and gate-keeper on the amount of visits to other medical suppliers. The recent health care reform in Germany forces public health care insurers to offer tariffs with gate-keeping. In Switzerland, gate-keepers in medical care have long been in use.

Additionally, the position of those medical suppliers that are not involved in coordinating and guiding patients and treatments is examined. Because those medical cannot refer patients but only receive referred patients certain unwanted incentives might occur. Thus, due to their smaller margin of actions and possibilities of taking advantage of it, compensation should emphasize different aspects than for case managers.

It is assumed that medical suppliers maximize their utility which includes maximizing financial outcome and leisure time. Often, such as in McGuire (2000), it is assumed that medical suppliers also gain some utility from helping their patients. This is not explicitly considered in this paper but might reduce some financial incentives that decrease the quality of care. Yet, it cannot be assumed that those ethical motives are so strong, that medical providers will always act in an altruistic way. Due to a slightly different position of a case manager the objectionable incentives of reimbursement are defined somewhat different than by Ellis (1998). Case managers can be induced not to attend to their patients properly either by over- or undersupplying. Secondly, they can pursue indirect risk selection by providing dissatisfying care to their patients in order to provoke them to choose a different case manager and finally, in order to avoid costs they can let other medical suppliers complete the treatments they should have done. Medical suppliers that are not case managers cannot refer patients to other suppliers if they do not want to treat them. Yet, they can supply an inadequate amount of care. If they can influence the decisions of the case manager they can also try to pursue risk selection. These points are discussed in section 3 in detail.

The remaining part of the paper is structured as follows: In the following section, medical suppliers are investigated who work as case managers and gatekeepers. At first, it is assumed that patients are assigned to one provider and cannot easily choose another one. Incentives due to compensation are analyzed and strategies to diminish false incentives are discussed. Later on, the assumption that patients are assigned to one case manager is lifted and consequences of a free choice of a case manager are illustrated. In the third section, medical suppliers that are not involved in managing diseases and guiding patients are in the focus. Three cases will be distinguished. Either those medical suppliers are completely not involved in determining the treatments they have to carry out or they can decide autonomously on therapies of referred patients or they can even influence the case manager. The paper finishes with some concluding remarks.

2 Case managers

2.1 Assignment of patients to one case manager

Position and compensation of the case manager

In the following part of this section, the focus is laid on medical suppliers who are responsible for the guidance of patients in a medical network but at the same time still offer health care treatments by themselves. Therefrom, the case manager has the referral monopoly. It is assumed that patients are assigned to a case manager and cannot easily resort to another case manager if they are not content with the medical performance of the initial case manager or the medical suppliers the case manager referred them to. Altogether, the only possibility for the assigned patients to gain access to health care is via the case manager.

Possibilities for reimbursement schemes for the case manager will be analyzed and resulting incentives will be discussed. The assumption of a fixed assignment of patients will be lifted later on and the impact of free choice of case managers will examined.

The case manager can affect the number of medical cases by persuading patients to consult him more often[1] and by referring or not referring patients. He also has some impact on the types of illnesses also by referring and by the treatment he selects. Thus, it would make sense to choose a compensation scheme where the case manager takes part in those risks as well. If the case manager is reimbursed by **capitation** he bears the whole health insurance risk. In that case, the case manager can gain most by undersupplying his patients. Yet, it has to be pointed out that the case manager can indirectly select risks by referring patients and thus transferring costs to other medical suppliers. This will only take place if the reimbursement of the case manager is independent of the compensation of the other medical suppliers.

To avoid this passing on of patients, a compensation-scheme can be implemented such that the treatments carried out by other medical suppliers directly reduce the capitation payment[2] of the case manager. In that case, the case manager does not only control the process of the therapy but is also responsible for the whole reimbursement alongside the medical attendance. From an insurance point of view, the case manager bears the whole health insurance risk for all medical so there might be some risk bearing costs. On the one hand, a case manager might have a smaller risk group than an insurance company since the size of the risk group is limited by his maximum workload of the case manager. Thus, the group balance concept might apply better to an insurance company than to one medical supplier. On the other hand, the case manager might be more risk averse than an insurance company. If the case manager determines all elements of a treatment for all involved medical suppliers and bears the entire insurance risk, he has a very prominent impact on how much medical care is allocated to a patient. Therefore, he can draw ample profit by undersupplying his patients if he is reimbursed by capitation. This profit can be gained on the one hand by neglecting treatments that he is responsible for. On the other hand, the case manager could also refrain from

[1] For a detailed discussion of physician-induced demand please refer to e.g. Evans (1974) and Phelps (1986).
[2] The capitation must, of course, be higher than in the case where the case manager must only pay for his own expenses.

referring patients to other medical suppliers. This might be particularly relevant in the case of expensive treatment from other suppliers such as surgery or other therapies that require hospitalization. In this respect, it might be problematic if the case manager must compensate for all other involved medical suppliers. Yet, it is necessary to point out that a global budget of a case manager can also have some positive network effects. For example, in the case of no global budget, a case manager could refrain from some medical services if he must only pay the cost while only other medical suppliers benefit from those services.[3]

If the case manager is reimbursed by capitation but does not have to compensate for the health care services of other medical suppliers, the case manager has a significant incentive to simply transfer patients rather then treat them. Hence, it should be examined if a capitation could be combined with other incentives to ensure a decline in of passed on patients.

A negative financial incentive for a capitated case manager in the case of referral could reduce the inducement of the case manager to refer patients unjustifiedly. Ideally, these "referral costs" should make the case manager indifferent between referring the patient and treating him on his own from a financial point of view. Attention should be paid to the fact that a case manager might have a higher incentive to undersupply his patients if he cannot refer them free of charge anymore. Therefore, a quality incentive should be provided e.g. a performance related component of the compensation that is adjusted to quality of care aspects.

In the case of a diagnosis-related **fee for admission** compensation, the case manager bears only some part of the financial risk – namely which treatments are applied. In the case of not perfectly correlated disease clustering a case manager also bears some risk regarding what kind of illnesses of the patients he treats if some diseases are more profitable. Yet, the medical supplier is not provided with a negative financial incentive if he treats more patients than he should. Hence, he can profit from increasing treatment cases and cases with a high lump sum compensation in relation to the required workload. The case manager will try to influence patients to consult him more often if he still has unused capacities. In case of a relatively high compensation the case manager might refrain from referring patients even in cases where he should refer them. In the case of a relatively low lump sum compensation, a case manager is induced to refer patients unwarrantedly rather than to treat the patient on his own. Recapitulatory, there are two undesirable incentive effects, either that the case manager does

[3] Such externalities can occur if the for example the case manager is a general practitioner and should carry out prophylaxis for some diseases where the case manager is not involved in the treatment in case of an outbreak of the disease.

not refer in cases of a relatively high lump sum or that the case manager refers patients with a rather low lump compensation too quickly.

If the fee for service compensation is diagnosis-related the case manager is induced to upgrade i.e. to classify his patients into higher compensated disease groups. One could argue that a budget could diminish the incentive to upgrade, but in reality a budget rather induces an increase of risk-selective referrals by the case manager. In the case of a budget, the case manager will survey intensely which cases are the most profitable for his restricted budget. Additionally, in the event of the threat of a budget excess, the case manager will be induced to simply refer all incoming patients. To avoid this, the budget could be designed in such a way that not only the treated but also the referred cases are incorporated in the budget of the case manager. Of course, this only makes sense when the case manager also decides on the classification of the referred patients or is at least significantly involved. In that case the case manager can gain profits by upgrading the cases treated by him, while simultaneously downgrading the referred cases. If the compensation of the other medical suppliers is determined by the diagnosis-related group to which the case manager assigned the medical case to, a systematic incentive of undersupplying arises for treatments not done by the case manager. Altogether, the imposition of a budget does not reduce incentives for upgrading and risk-selectively referring patients and thus cannot solve these problems.

If a medical supplier is reimbursed by a **fee for service** compensation scheme, he will be induced to extend the amount of treatments and thus will not be induced to work efficiently. Therefore, a case manager will try to treat patients on his own and hence delay referrals or even refrain from them. However, financial incentives could be designed such that that case managers sooner refer patients. This can be done by a referral award by which the case manager is ideally always indifferent from a financial point of view between referring a patient and treating him.[4]

If the case manager is reimbursed by a **fixed income** the case manager is not induced to treat his patients economically. Yet, he does not have any incentives to refer patients too easily or only reluctantly. An incentive to a more economic treatment of patients can be created by introducing a performance-related compensation element.

In case of a fee for service compensation, the reimbursement does not only provide no incentives for allocating resources efficiently but also induce the case manager to waste

[4] This referral award is the complete contrast to the referral costs in cases of a capitated case manager. Yet, it will be difficult to design an award that will make the case manager indifferent between referring and treating in all possible cases.

resources and to carry out more treatments than necessary. Thus, compensation through a salary is preferable from a resource allocation point of view. Yet, the motivation of a medical supplier could be higher in the case where he is reimbursed depending on his work-load. It is necessary to point out that via a performance-based compensation element the case manager is induced to undersupply and to refer patients more often than necessary. Thus, a quality-based performance related compensation component could reduce these undesirable incentives.

Implications for the medical care process

The analysis of different reimbursement schemes for case managers showed that from a resource allocation point of view a fixed income is preferable to a fee for service compensation. If the case manager is reimbursed by capitation, additional financial incentives should be created in order to prevent the case manager from undersupplying and intensive referring practice. While implementing a medical network with case management and gate-keeping, it is very important to adjust the chosen reimbursement scheme to the aims of the network. Apparently, there is a trade-off between cost and quality incentives. Therefore, the operators of a medical care network must decide whether they rather want to aim for a cost or for a quality effective network or a mixture. Yet, in practical implementation of medical network one should not act from the assumption that a carefully chosen compensation system averts divergent behavior of case managers at all times. Nevertheless, it would still be advisable to try to eliminate as much objectionable financial incentives as possible while designing the reimbursement in a medical network.

2.2 Pressure of competition among different case managers

Position and compensation of the case manager

If patients are free to choose a case manager, the competition among different case managers could increase the pressure to perform well. The case manager will endeavour to avoid that patients for which they receive a high compensation choose another case manager and thus attend these patients to their comfort. Yet, it remains to be examined how the existence of several competing case managers can improve the quality and the cost effectiveness of medical care. In the following section, it is assumed that patients will resort to another case manager if they are not content with the performance of their initial case manager and, as well, with the medical suppliers the case manager referred the patients to. Therefore, a case manager has comparative advantages if he cooperates with other well-performing medical suppliers. In addition, it is supposed that a patient will be dissatisfied if he is referred to other medical suppliers without medical reasons.

If a case manager is compensated by **capitation**, he will prefer patients that rarely need medical care, i.e. the low risks from an insurance point of view. Hence, if a low risk requires health care, the case manager will provide high-quality care. He will not undersupply health care or simply refer to other medical suppliers because he does not want to lose low risks to other case managers. Yet, if high risks (i.e. those risks that cause health care costs frequently) consult the case manager, he can try to dissatisfy the high risks and thus to pursue indirect risk selection by a low quality of care. Since other case managers are not interested in high risks as well, they will not try to attract them through a better quality of care. Altogether, high risks do not receive a better medical care even if they have a possibility of choosing among different case managers. Thus, a quality incentive as discussed in the section before should be added to the case manager's compensation.

The tendency of a diagnosis-related **fee for admission** compensation reimbursed case manager to treat well-paid cases himself and to refer not so well-paid illnesses, is diminished if the case manager dissatisfies his patients with this behaviour and is in danger of loosing them because of his behaviour. The pressure of competition also decreases the incentive of the case manager to undersupply and, thus, improves the process of medical care.

There is an incentive to provide more medical service as necessary if a medical supplier is reimbursed **fee for service**. As was discussed in the previous section, a case manager is induced to refrain from referrals. Yet, a pressure of competition can reduce these unwanted incentives if the case manager has to fear that his patients will turn out to be dissatisfied if the case manager refrains from referring them too often.

In case of a **fixed income** the case manager is not induced to change anything in his treatment behaviour because of other competing case managers and avoiding patients to leave him.

Implications for the medical care process

The analysis of different compensation schemes has shown that the case manager is interested in not losing all of his patients if he is reimbursed by a capitation or by fee for admission. Yet, it still has to be examined how the fact that the case manager is held responsible for the health care of the medical suppliers, he refers his patients to influence the care process.

If the case manager cannot influence the performance of the other medical suppliers he refers his patients to, the case manager might be induced to rather treat profitable patients on his own. Otherwise he might have to fear that the treatment of the other medical suppliers could dissatisfy his profitable patients. He has to trade off what his patients disapprove more – either to be treated by the case manager even if he should refer them or to be treated by the efficient expert who only provides a low quality. Thus, the case manager should be able to influence the behaviour of the other medical suppliers if he is held responsible for their treatment by his patients. The case manager can influence the other medical suppliers if he has the responsibility of the budget and can set financial incentives for other medical suppliers to treat profitable patients well. But in that case there is – as discussed in the section on capitation – a strong incentive that non-profitable patients do not receive the required amount of care. Furthermore, the case manager can also influence the behaviour of other medical suppliers if he has the possibility to choose among them. Yet, the other medical suppliers must be reimbursed in a way such that they have financial penalties if only few patients consult them.[5] However, if a case manager signals a profitable patient, the medical supplier who the patient is referred to will try to treat the patient to the patient's satisfaction in order to ensure that the case manager will refer more patients to him. It remains questionable what happens if a case manager also signals non-profitable patients to other medical suppliers. The other medical suppliers could be induced by such a signal to dissatisfy the non-profitable patients and to help the case manager to pursue risk selection. Thus, a whole market for malpractice could develop.

Recapitulatory, it can be pointed out that the pressure of competition among different case managers diminish the incentives to undersupply and to simply pass on patients but only in cases of profitable patients. Since non-profitable patients are not attractive for all case managers, competition pressure will not change anything in the way they are treated medically.

3 Medical suppliers that are not involved in case managing

3.1 Complete determination of treatments by case managers

In this section, it is assumed that there is a case manager who completely decides on the treatments of all medical suppliers involved in the therapy process. The medical suppliers except for the case manager[6] only carry out determined treatments. In that case, they cannot induce demand of patients nor have any influence on what kind of illnesses occurs. Thus, compensation schemes like capitation or admission fees transfer some risks to those suppliers

[5] Such a negative utility does not occur when the case manager is for example reimbursed by a salary.

[6] In the remaining part of this section the medical suppliers that are not involved in the determination of treatments are referred to as other medical suppliers.

which they cannot influence. On that account, it does not seem advisable to choose these reimbursements. If the other suppliers are compensated by a fee for service scheme and the treatments are determined ex ante, they do not have any influence on their financial income. Yet, their earnings vary depending on what cases are referred to them. Thus, compensation through a salary is preferable.

The assumption that the case managers determine all parts of a therapy and coordinates all treatments which other medical suppliers will be involved in, might not be realistic in all cases. Particularly, treatments of long-lasting diseases are often quite complex and also require some council by different medical specialists. In addition, the case manager does not have the necessary knowledge on all medical areas of expertise and thus cannot determine all essential treatments. Yet, medical suppliers that are involved in some disease management programs might be in the situation that they only have to carry out predefined treatments. However, it cannot be assumed that medical care services can be done within a disease management program because usually they are only available for some diseases. Thus, only a small portion of medical services might be carried out when all treatments have been predetermined.

3.2 Complete coordination by the case manager

In the following, it is assumed that the case manager assigns patients to other suppliers but does not specify the treatment the other medical suppliers have to carry out. This is a more realistic assumption for a typical case management program where for example a nurse or a general practitioner acts as case manager. In that case, the other medical suppliers cannot influence the number and kind of cases they treat but they can decide independently on what kind of treatment they choose. Thus, it seems to be sensible to provide an incentive for the other suppliers to act cost-effectively. A capitation would let the other suppliers experience some deviation in income on factors such as number of patient visits and kinds of illnesses that the other medical suppliers cannot influence. A diagnosis-related fee for admission compensation only puts some pressure on the other medical suppliers to treat the cases on hand efficiently. Thus, a DRG-compensation seems to be reasonable, but still it provides the incentive to undersupply medical care to the patients. A quality-based performance-related component of the compensation can diminish this undesirable incentive. Salary and fee for service compensation do not generate an incentive to undersupply but also do not include any inducement to provide care in an economically efficient way. In the case of a fee for service reimbursement, there is even an incentive to waste resources by oversupplying. This incentive could be reduced by introducing some performance-based compensation with the focus on cost-effectiveness. Yet, the incentive for the fee for service supplier has to be stronger in order to reduce the oversupplying.

3.3 Incomplete guidance of patients

In practical implementation of medical networks, it cannot be assumed that the case manager can provide all diagnosis and can exclusively decide on what kind of other medical supplier has to be consulted next. Even if a general practitioner is the case manager, he might not be able to supply substantial counsel on further required treatments in all cases. Yet, other medical suppliers can also actually influence guidance of patients in disease management programs by advising the patient to quit the program. Thus, medical specialists cannot be excluded from diagnosing illnesses and coordinating the care process in many cases and they can use this diagnosis and coordination influence capability in their own interests. For example, medical specialists could pursue risk selection by trying to persuade the case manager to refer unwanted patients to another specialist. If all specialists regard a case as financially disadvantageous they will all try to dissuade the case manager from referring the patient to them. Therefore, the case manager is not counselled by other specialists from a medical point of view, but will be influenced because of the specialists' financial motives.

Thus, in practical experience of medical networks, it has to be examined how the medical suppliers who are not case managers can use this influence to the disprofit of the medical network. There is also a trade-off between cost effective financial incentives and an unbiased counsel of other medical suppliers. In the case of strong incentives to act cost-effectively, it has to be accepted that medical specialists will sometimes give advice motivated by their own financial interests. Alternatively, if the other medical suppliers are compensated by a salary they are not provided with an incentive to treat there patients particularly efficiently but at the same time they are not induced to give biased council to the case manager.

4 Conclusion

Integrated Delivery Systems and medical networks are often regarded as possibilities to improve quality and cost-effectiveness of medical care and, thus, as a solution for the problems with the German health care system. Certainly, a coordinated health care where all medical suppliers work together hand in hand in order to achieve a high-quality, low price treatment of patients is a desirable vision of a health care system. However, under the realistic assumption that medical suppliers have their own interests such as e.g. financial objectives, it has been shown that they might be induced to depart from the optimal way of treating patients.

In the focus of this paper is a medical care network where the guidance of patients is done centrally by a case manager. Economic implications of different reimbursement schemes for the case manager and for other medical suppliers were analyzed and possibilities of diminishing wrong incentives were discussed. As a result a trade-off between cost and quality incentives was identified in all discussed compensation schemes. It was shown that combinations of different compensation schemes could lead to a decline of false incentives. Yet, this automatically leads to a higher complexity of the reimbursement of the case managers which is not desirable as well. Particularly, in the medical care sector some compensation methods tend to already be very complex like e.g. DRG compensation. Altogether there is a trade-off between a low complexity of reimbursement and an optimally adapted compensation.

In real-life medical networks, there might be more medical suppliers involved in the guidance of patients, especially in cases of very complex illnesses where the council of a medical specialist is required. This complicates the matter in particular if it assumed that these medical suppliers also pursue their own interests. In cases of different compensation schemes for different medical suppliers there might also be a tendency for collusive behaviour.

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