

Total case management – the key to really estimate cost effectiveness in certain orthopedic conditions in Germanys health system.

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Abstract

The costs of orthopedic treatment in Germany are administered in certain budgets independently from each other. For the prescription of technical orthopedic devices, and for the prescription of special rehabilitation services the agreement from the medical services of the health insurance companies is mandatory. The costs for orthopedic surgery do not need to be granted by these medical services and are paid by the insurance companies without prior control. Purpose of this paper is to enlighten these proceedings on the example of scoliosis management and to explain the pitfalls arising from trying to save the maximum in the individual budgets. We have calculated the costs for scoliosis management due to two different categories, (1) „Best Practice“ conservative management and (2) low budget conservative treatment. While the costs for „Best Practice“ conservative management can be estimated to be 9.500,- € until the end of growth (2 X intensive out patient rehabilitation, 3 braces and physio), the costs for low budget treatment usually leading to spinal fusion can be estimated to be 30.000,- € until the end of growth (2 insufficient braces, spinal fusion surgery). Conclusions: A Total Case Management (TCM) is necessary to estimate the real costs of the individual orthopedic case. Savings, due to low quality treatment in individual budgets alone bear high risks of increasing the Total Case Budget (TCB) drastically.

BACKGROUND

The costs of orthopedic treatment in Germany are administered in certain budgets independently from each other. The health insurance companies in the German health system have to pay for out-patient services within the framework of the network of physicians (GP, Orthopedic specialist), for rehabilitation services (in-patient rehabilitation, out-patient rehabilitation) and for the out-patient and in-patient service of orthopedic specialists (orthopedic surgery).

While the costs for out-patient treatment with respect to pharmacology, physiotherapy, physical therapy are limited in special budgets, for the prescription of technical orthopedic devices, supplies and accessories, and for the prescription of special rehabilitation services the agreement from the medical services of the health insurance companies is mandatory. It should not be denied that it is necessary to control the costs of technical orthopedic devices, supplies and accessories, because many of these will end up in the cupboard of the patient and not on the patients` body [1-4]. One problem obviously is that many of these devices are not

effective / specific enough [5-10] to motivate the patient to be compliant in the mid- or long-term [7-9]. Another problem is that the prescribing physician is not specialized enough to estimate the best possible management for the individual case [10]. A minor problem additionally could be the involvement of physicians into the business with technical orthopedic devices for other reasons than licenses due to patents granted.

The medical services of the health insurances (MSHI) will not be able to estimate the needs of the individual properly according to the information given by the treating physician. So there is a grey area with overtreatment by the physician and undertreatment due to the advice given by the MSHI.

The costs for orthopedic surgery do not need to be granted by the MSHI and are paid by the insurance companies without prior control. The insurance receives the invoice according to the diagnosis related groups (DRG's). However, especially in the field of orthopedic surgery there are many interventions which are operations by choice and in most cases not urgently necessary [11,12]. In the future the community will not be able to bear the costs of spine

surgery in patients with spinal claudication and degenerative scoliosis, two diagnoses increasing at this stage [13,14] with sedentary lifestyle [15-17]. So if it would be possible to develop something like a conservative „Best Practice” management for patients with chronic low back pain, like we have in scoliosis treatment [18], there would be the possibility to reduce the incidence of surgery drastically in patients with chronic low back pain, spinal claudication and degenerative painful scoliosis [6-8].

In Germany the budget for physiotherapy seems too small for a successful outcome of low back pain treatment before the onset of chronification to prevent patients from needing more intensive rehabilitation or spine surgery. In-patient rehabilitation has been estimated to be too expensive and therefore out-patient rehabilitation courses have been implemented. Nevertheless chronic low back problems increase [13,14] at the moment, increasing the costs for conservative and surgical management as well.

REVIEW OF THE LITERATURE AND FINDINGS

Purpose of this paper is to enlighten the problems with cost effectiveness in orthopedic conditions using the example of scoliosis management comparing different strategies of management and to explain the pitfalls arising from trying to save the maximum in the individual budgets.

According to evidence based practice (EBP), the treatment of Adolescent Idiopathic Scoliosis (AIS) consists of long-term out-patient physiotherapy, various procedures of more or less intensive rehabilitation, brace treatment and spinal fusion surgery. While there is evidence on a higher level (II) for conservative treatment [11,12,19-22], no evidence on level II or over (at least prospective controlled studies) have been found for spinal fusion surgery [19,23-29]. On the other hand the rate of complications of spinal fusion surgery [30,31] has been underestimated so far and will allow to estimate further costs due to the consequences of spinal surgery (physiotherapy, rehabilitation, braces and salvage surgery) [23,24]. There is good reason to assume that „Best Practice” scoliosis management will reduce the rate of progression [32] and by that the rate of spinal fusion [33,34], while low budget conservative treatment of scoliosis like in the US with a clear preference of spinal fusion surgery [35], conservative treatment will not necessarily decrease the number of operations performed [36].

We have calculated the costs due to two different categories, (1) „Best Practice” conservative management and (2) low

budget conservative treatment with additional spinal fusion surgery.

„Best Practice” conservative management of AIS will need out patient physiotherapy (PT) as a long-term treatment which can be estimated to cost 1.000,- €, three high correction braces according to growth at 2.500,- € each (7.500,- €) and two phases of various procedures of more intensive rehabilitation at 500,- € each (1.000,- €). Early onset of treatment promises less costs and late onset of high quality conservative management will cost more than estimated at this stage (Table 1.)

While the costs for „Best Practice” conservative management can be estimated to be 9.500,- € until the end of growth (3 braces, rehabilitation and physio), the costs for low budget treatment usually leading to spinal fusion can be estimated to be 30.000,- € until the end of growth (2 insufficient braces, spinal fusion surgery).

These costs are mixed calculations until the end of growth.

Figure 1

Table 1. Cost of „Best Practice” conservative management vs. Low budget conservative scoliosis treatment until the end of growth.

	Long-term PT	Rehabilitation	Brace	surgery	€
Early (I)	X	-	-	-	1.000
Early (II)	X	2	2	-	7.000
Normal	X	2	3	-	9.500
Late	X	3	4	-	12.500
Low Budget	-	-	2	X	30.000
Low budget cheapest	-	-	2	X	22.500

While a high %-age of patients treated conservatively with low efforts on a low budget basis have to be operated on, a high quality treatment (the earlier the better) promises to avoid surgery and in some cases avoid brace treatment and rehabilitation as well. The costs for long-term PT were estimated 1.000,- €, the cost of a brace 2.500,- €, the cost of a three day intensive out patient program of rehabilitation 500,- € and the cost of the surgical intervention 25.000,- €. The cheapest possible surgical treatment was 18.500,- € plus two cheap braces at 2.000,- € each. The costs of salvage surgery and other complications of surgery in the long-term cannot be estimated, simply because there is no mandatory reporting of the complications of spine surgery in scoliosis

conditions [31].

APPRAISAL OF THE FINDINGS

There is evidence that physiotherapy, more or less intensive rehabilitation and correcting orthoses of highest quality can prevent spinal fusion surgery to the highest possible degree [18-22]. Because of this evidence treatment guidelines [37] have been established in order to avoid unnecessary surgery by applying the conservative measures as indicated individually. More and more evidence appears for the application of physiotherapy in the treatment of scoliosis [19-21,38-40] and the best possible bracing standards available [22,41,42] have been made easier to wear [42,43] in order to allow a better compliance.

Precondition for this „Best Practice” conservative management is the availability of trained specialists [18]. Special training is at a high cost for the specialist and the elaborated bracing technology available today cannot be provided on the cheapest level. Conservative management provided by untrained professionals will usually be at the cost of the patient and the community.

We must admit that in Germany a simple dorsal fusion is already available for 18.500,- €, but on the other hand some of the patients treated on a low budget basis have also more than 2 braces prior to surgery and out patient PT as well. The worst case of conservative treatment with long-term PT,

more intensive rehabilitation and four braces still is far less expensive than the cheapest low budget treatment leading to an operation. Nevertheless in „Best Practice” conservative management there is evidence that most of the cases can be treated much cheaper in case they are admitted to treatment the earliest possible. Part of those will not even have the need for rehabilitation services and some of the ones having rehabilitation will have less braces, because if high correction braces are applied early the children treated can wean off the brace right after the onset of menarche / voice change. This will never be the case in patients treated with braces of low budget standard [41]. So, if the person in charge to administer the budgets for braces and rehabilitation, tries to save money and does not grant the money necessary for high correction braces, the patient automatically is at risk for having surgery, with possible follow-up costs [23]. This is not only a matter of budget, but also a matter of useless impairment of quality of life of a patient and, by this, will directly affect basic human rights.

We are aware of the fact, that some patients treated according to „Best Practice” conservative management will want spinal fusion treatment in later life, however, the earlier surgical treatment is applied, the earlier salvage fusion (Fig. 1.) will have to be expected which will be at a higher cost than the initial fusion surgery for the community and at a higher “health cost” for the patient as well.

Figure 2

Fig. 1. This patient probably will need salvage surgery in the very end.



History in the patient's words:

„I was diagnosed with Idiopathic Scoliosis with the age of 12 and wore a Milwaukee Brace until 1995 when I was 15 years old and had my spinal fusion. I don't know my previous curvature degrees but after the surgery I kept a 41° right thoracic and 27° left lumbar curves. They extracted bone from my right hip as at the time I didn't have an evident rib hump. The physical deformity wasn't noticeable except for the upper left shoulder and a slightly prominent right shoulder blade. For the last 13 years, the rib hump as appeared and grown rapidly and my left side is now more and more concave and the deformity continues daily. I have a lot of acute pain on the left side, the side of the concavity, and feel really awkward when seating against chairs. The thing is that the curvature hasn't progressed since my surgery and the doctors have different opinions to what is happening. Some say that it is a thoracic collapse and that this is normal, as if the rib cage is still responding to my deformity. Others say that there could be vertebral rotation and that I should keep on taking pictures but warn me that a revision surgery is dangerous with a high risk of paralysis. Others simply and absurdly deny my continuous deformity. It is very quick and I'm pretty desperate. I feel strange walking and wearing clothes and my left arm goes back a bit more every day and my right one protrudes at the front. Most people don't notice it but I feel and see the subtle changes. My left ribs at the front protrude a lot too. I had a sense of the evolution of this but thought that it was going to stop since I had a spinal fusion. I'm completely in the dark here and desperate and I'm finding difficult to trust doctors. I had an MRI last month but everything turned out ok, with no hernia to explain the left side pain that appeared last August and simply doesn't go away. Personally, I think that this pain has a direct connection to the growing concavity of the left side of the rib cage. Is this normal? Do torsos continue to rotate after successful spinal fusion?

I read your study about complications of scoliosis surgery and I can honestly say that today I'm a pretty evident failure concerning scoliosis surgery and feel completely abandoned by orthopedic surgeons. This is not stopping and I can only imagine myself in the future (10 years) as pretty crippled man. I would like to hear from you. I can also upload x-rays if you want to.”

As can be seen in this discussion there are still many variables which do not conclusively allow a final and precise calculation of the costs arising from orthopedic treatment.

Nevertheless this paper should be regarded as a pilot paper, as the starting point to enlighten also other treatment approaches in use today. For instance, there is also no prospective controlled mid- or long-term study on spine surgery in patients with low back pain, however it is clear that the costs of spine surgery reduce the communities budget for health care drastically when the industry is able to pay so much money for individuals who have designed some „new screw” [44]. The spine is still regarded as a profit centre [45] and this money is lost to the community in the very end when there will be no change of paradigms towards a look at the total costs which are spent for the individual.

The real costs of one case can only be estimated on the basis of a Total Case Management (TCM). Savings in the individual budgets will not pay in the end.

CONCLUSIONS

A Total Case Management (TCM) is necessary to estimate the real costs of the individual orthopedic case.

Savings in individual budgets alone bear high risks of increasing the Total Case Budget (TCB) drastically.

High quality treatment will allow to save the most in the very end and is the least costly for the patients health, wellbeing and quality of life.

CONSENT

Written informed consent was obtained from the patient for publication of his case and accompanying image.

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