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How to reduce costs in transcatheter aortic valve implantation

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During the past few years, transcatheter aortic valve implantation (TAVI) has become a mature procedure, results have become reproducible and safety has increased.[1] Nevertheless, the overall cost for TAVI is still higher than the cost for surgical aortic valve replacement (SAVR), mainly due to the higher price of the valve. In this journal, Brecker *et al*[2] published a UK cost utility analysis based on data from the ADVANCE registry (TAVI group) and from the PARTNER B study (medical management group). They found that TAVI is cost-effective, even in the high-risk subgroup of the ADVANCE registry. This analysis is of importance since it includes patients reflecting contemporary patient selection in Europe. Furthermore, unlike most countries, the UK and the USA have made explicit statements about their willingness to pay ratios (£20 000 and US $50 000, respectively). Thus, cost-effectiveness analyses in these countries may be of particular interest.

Although TAVI appears to be cost-effective, further reduction of index hospitalisation and follow-up costs are certainly desirable. Several strategies may achieve this. Some are evidence based, and some reflect personal and institutional experience (box 1).

Patient selection: The patient's primary problem has to be severe aortic stenosis, with suitable anatomy for the planned TAVI device. If the patient's primary problem is related to another condition, medical management may be the best option. There is no doubt that lower risk patients will be treated in future. As shown by Brecker *et al* in this issue of Open Heart, selection of lower risk patients resulted in lower incremental cost-effectiveness ratio per quality-adjusted life years gained. Lower risk patients may have shorter hospitalisation times and less complications. Prognosis is better, and the follow-up costs may be lower.

Avoid complications: Owing to improved patient selection, operator experience and better materials such as lower profile catheters, complication rates have decreased during the past years. Even stroke rates have come down. Although complications will always remain, lower complication rates can be anticipated in future. Lower rates of complications will result in shorter hospitalisation time and fewer costs. Planning of the procedure is important. For instance, at the Cantonal Hospital Lucerne, the whole team meets before a procedure to discuss important steps such as location of the puncture site, selection of the type and size of the valve and implantation depth.

Device cost: Costs for TAVI valves have already decreased (eg, in Switzerland by about 10–15% during the past 3–4 years), and they will certainly decrease further, thus increasing cost-effectiveness of TAVI compared with medical therapy as well as SAVR. In the present analysis, cost for a CoreValve was £14 800, whereas the cost for a surgical valve was £2000. Thus the price for a transcatheter valve was still more than seven times the price of a surgically implanted valve.

Transfemoral first approach: Analyses have shown that costs are higher in patients undergoing TAVI through alternative access routes. Therefore, a 'transfemoral first' strategy will likely reduce hospitalisation costs.[3]

Local anaesthesia: Despite the fact that transfemoral TAVI under conscious sedation is safe, many (experienced) centres still perform TAVI under general anaesthesia. General anaesthesia may facilitate intraprocedural transoesophageal echocardiography, which may allow for early detection of

Box 1 How to reduce costs in transcatheter aortic valve implantation (TAVI)?

1. Improve patient selection
2. Avoid complications
3. Reduce device costs
4. Use a transfemoral first strategy
5. Perform TAVI under local anaesthesia
6. Avoid bladder catheterisation in men
7. Organise rehabilitation early
8. Make Tuesday your TAVI day
9. Never compromise on quality

intraprocedural complications; but these complications have become very rare. If blood pressure drops, tamponade and relevant mitral regurgitation can be quickly ruled out with transthoracic echocardiography. Use of local anaesthesia has been associated with shorter procedure time, shorter hospital stay and reduced costs.[4]

Avoid bladder catheterisation in men: This will help to avoid postprocedural bleeding complications and problems with passing urine once the catheter is removed.

Organise rehabilitation early: In the ADVANCE study, average hospitalisation time was almost 10 days, and 37% of patients required rehabilitation. Depending on the health system and the general condition, patients requiring rehabilitation may have to wait in hospital until they can be discharged to a rehabilitation clinic. Therefore, rehabilitation should be organised as early as possible (eg, on the day of hospital admission, or even before admission). In Lucerne, we inform our social workers in advance, and they see the patients early on the day of admission.

Make Tuesday your TAVI day: Why Tuesday? Patients will come to the hospital on Monday, and you will have the whole week with the complete hospital staff present to manage potential complications and perform postprocedural imaging. Many patients (even elderly) may be safely discharged before the weekend.

Never compromise on quality: Healthcare costs are rising in most countries. As physicians, we have the responsibility to use resources reasonably, and make sure we are involved in discussions and decisions related to the healthcare system. Otherwise, politicians and economists will do the job without us. However, safety should never be the price for reduced costs. The most important goal remains to perform TAVI at the highest quality possible.

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