Tim Nieberg and Erwin Hans

Better healthcare by improving hospital logistics

They have already seen a great many hospitals from the inside. Thankfully not as patients but as researchers of care logistics. In the process, they realized that, traditionally speaking, hospitals are not geared to efficiency. But in a changing healthcare landscape, they have no choice but to be, say Tim Nieberg and Erwin Hans. A lot can be achieved with just a few simple steps. However, they are aware that each hospital is different.

Outlining the changing 'healthcare landscape' in the Netherlands and hence the changing preconditions with which hospitals are faced, Erwin Hans says, 'When waiting list issues went right to the top of political agendas, hospitals were forced to think about their logistic procedures. Funding made them on edge as well. If a patient was in hospital for ten days, the hospital would be paid for those ten days. Now there's a fixed rate for treatment, whether the patient's in hospital for seven or for ten days. The effect is that we are trying to achieve optimization from two different angles. Hospitals have to cut costs and ensure that they organize their staff complement as efficiently as possible. Besides, expensive equipment should be used to optimum effect.'

Tim adds, 'The other angle is the patient. Instead of having to visit the hospital on different days for appointments, having all appointments on one day would be a lot better. Mind you, harmonization between the various departments is by no means a matter of course, even though you would think so. Shorter hospital stays or shorter waiting lists are as much in the hospital's interest as they are in the patient's. But that does involve a change of attitude on the part of the doctor. From his professional point of view, the patient sitting opposite him is the most important person in the world. A good thing in itself, but the doctor should be looking at the whole picture a bit more and at the patients who are still in the waiting room. If you as mathematician want to convince him that there is room for improvement, you need to have what it takes.'

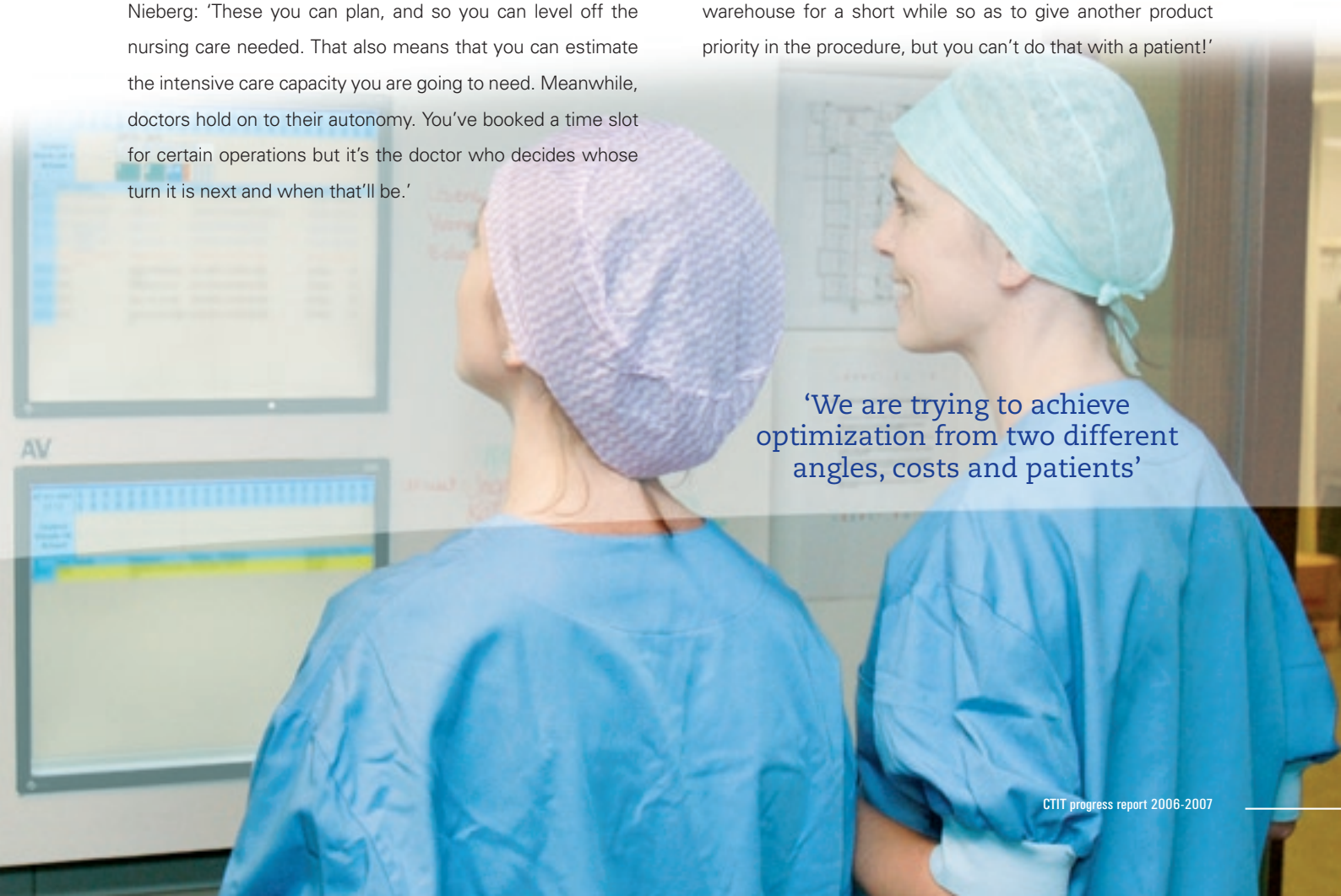
'For example, we investigated whether earmarking an operating theatre especially for emergency operations was useful,' Erwin continues. 'Most hospitals have them and have been doing that for years. The Erasmus MC hospital in Rotterdam decided to take a different approach. There they take account of which operations are finished first and then they can schedule emergency operations after that. Instinctively, you'd say that a separate operating theatre means you're on the safe side but in reality things are quite different. Booking rooms in other operating theatres improves performance criteria. However, you have to remember that each hospital has its own jargon: for instance, what is understood by the term 'operation' and what does 'preparation' involve exactly? You can gain time by putting tighter planning schedules in place for transporting and preparing patients. Our conclusion is that a single emergency operating theatre is tantamount to having no emergency operating theatre at all!'

'Another aspect, particularly in regional hospitals, is that in 80% of all cases, you know beforehand what operations will be taking place. Groin hernias, cataract operations, you know that these account for the largest number of surgical procedures.' Nieberg: 'These you can plan, and so you can level off the nursing care needed. That also means that you can estimate the intensive care capacity you are going to need. Meanwhile, doctors hold on to their autonomy. You've booked a time slot for certain operations but it's the doctor who decides whose turn it is next and when that'll be.'

Leafing through a booklet with practical cases, Erwin Hans hits on night duty in hospitals. Having three teams permanently on duty at night, some of whom sleep at the hospital, and get paid for it, is no exception but is it really necessary? The researchers worked out for the hospital that it could reduce the number of emergency team members from nine to five and still guarantee the same level of care.

'It's surprising just how big the differences are that you come across. With our 'common sense' approach, we helped the Amsterdam AMC hospital slash their waiting lists for non-emergency CT scans from 21 to 5 days, whereas a regional hospital is asking us to cut down ten-minute waiting times. Developing a single tool for all hospitals is an illusion.'

'In a sense, our work at the CTIT is driven by two strategic research orientations – eHealth and Industrial Engineering and ICT. At the institute, we work closely with mathematicians Richard Boucherie and Johann Hurink towards achieving a solid base in Stochastic Operations Research and Discrete Mathematics. We can use previous experience we've gained in industrial production environments in hospitals too, though never on a one-to-one basis. You can store a product in a warehouse for a short while so as to give another product priority in the procedure, but you can't do that with a patient!'



'We are trying to achieve optimization from two different angles, costs and patients'