Chapter 1

General Introduction
Introduction

Critically ill patients have been transferred between hospitals for decades. In the past this occurred mainly to access additional diagnostic or therapeutic possibilities not available at the referring hospital, but these days also in cases where intensive care unit (ICU) beds are unavailable, or as a reverse transfer back to the hospital of origin.

The obvious question has always been how to maintain the necessary level of critical care during such a risky procedure like patient transport. This question was asked for the first time in 1975.\cite{1} Even then, the answer of these pioneers was the use of an experienced and properly equipped transfer team. However, many years and many publications later, this still was not established. For example, in 2005, Ligtenberg published his study about the quality of transferring the critically ill in our region, the Northern part of the Netherlands.\cite{2} His disturbing results; during 34 of in total 100 transfers, adverse events occurred. It was estimated that 70% of these events were avoidable. This and other publications finally forced the Dutch Ministry of Public Health in 2007 to develop guidelines stipulating that all critically ill patients transferred between ICUs in different hospitals be transported by a Mobile Intensive Care Unit (MICU) with a specialized retrieval team.\cite{3} This led to the deployment of a nationwide system of seven MICU centers in the Netherlands. Our MICU service at the University Medical Center Groningen is one of them and started in March 2009.

In this thesis we aimed to study different aspect of our MICU service. Although we felt and still do feel its additional value for transferring the critically ill patient, we feel obliged to answer several questions:

Is it true that a prepared, trained and experienced transport team with the right equipment will result in a better transfer with less adverse events?
What kind of adverse events occur during transport?
How should a specialized transfer team be trained?
What is the regional impact of a MICU service?
Are there specific transport related issues we should be aware of?

Outline of the thesis

In chapter 2 we provide a further background of all aspects of transferring the critically ill. In this review we look back at the first publications in this field and what information has been added through the years. It is an overview of all relevant aspects of transferring critically ill patients and sums up where we are today.
In chapter 3 we analyzed our first 74 transfers with our MICU and compared these transfers to 100 transfers described in a previous study before the establishment of our MICU service. We aimed to answer the question whether a MICU with specialized retrieval team results in better transfers with less adverse events.

In chapter 4 we studied all adverse events and incidents that occurred during a study period of 30 months with 353 transfers. We give examples of how they influenced transfers and how they may be anticipated.

In chapter 5 we describe our training program. According to most guidelines, all involved in patient transport should be trained to develop skills required for these transfers. However, there is scant literature about these training programs. We therefore decided to set up our own training program. In this chapter we describe our training program and the adjustments we made along the way.

In chapter 6 we studied the regional impact of our MICU service. Since there are several reasons for transferring a patient to another hospital, there are also several different possible receiving hospitals. Patients who are transferred for additional therapeutic or diagnostic procedures should primarily be transferred to higher level ICUs. Contrarily, stabilized patients transferred back to the ICU of origin should primarily end up in a lower level ICU. We aimed to find out whether patients were transferred to the right level of ICU, taking into account the cost of a MICU service and mortality 6 months after transfer.

In chapter 7 we studied the observed changes in blood pressure occurring during acceleration and deceleration of the MICU. We wanted to study whether this phenomenon is purely due to a physical measurement artifact or whether patient characteristics are involved as well. That is, should the observed change in blood pressure lead to changes in therapy?
References


