Chapter IX
Informatics Applications in Neonatology

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ABSTRACT

Neonatal care is an extremely data-intensive activity. Physiological monitoring equipment is used extensively along with web-based information tools and knowledge sources. Merging data from multiple sources adds value to this data collection. Neonatal databases assist with collecting, displaying, and analyzing data from a number of sources. Although the construction of such databases can be difficult, it can provide helpful support to clinical practice including surveillance of infectious diseases and even medical error. Along with recording outcomes, such systems are extremely useful for the support of audit and quality improvement as well as research. Electronic information sources are often helpful in education and communication with parents and others, both within the unit and at a distance. Systems are beginning to be used to help with decision making – for example in the case of weaning neonates from ventilators, and this work is likely to become more important in the future.

INTRODUCTION

This chapter will outline the potential value of and barriers to the use of an informatics approach in neonatology. The term neonatology refers to the branch of medicine concerned with the care, development, and diseases of newborn infants [1]. Although the term neonatal strictly defines the newborn period from birth to four weeks of age, we will refer to neonatology in a broader sense.

This may include everything from routine care of the normal newborn infant with the mother, on the postnatal ward or at home, through to provision of intensive care for the smallest and sickest of infants. In many cases this will involve premature infants who are often older than four weeks of chronological age but less than 44 weeks corrected gestational age. This type of care is complex and generates large amounts of clinical, monitoring and laboratory or imaging data. However, it also has some information requirements that are in common with that of an uncomplicated term infant on the postnatal wards. Specifically, there is a need to link infant details with the antenatal history, maternal demographic data and clinical coding.

The five main areas where neonatology and informatics relate well are the provision of clinical care, including physiological monitoring and computer based clinical guidelines; data collection and management incorporating quality or benchmarking issues; education and training of staff; support of parents, including providing clear accessible information; and research.

CLINICAL CARE

An informatics approach has much to offer in terms of both efficiency and clinical safety. Firstly, it may serve as a web-based resource or repository for information. Secondly, it can

Figure 1. Clinical workstation interface in our institution