

Applications and Markets

TDM in Neonates and Paediatrics

There is increasing discussion about the need for measurement of selected drugs in paediatrics and neonates. Drugs including; antiepileptic drugs (e.g. phenobarbital, phenytoin), caffeine, indomethacin, theophylline, digoxin and in particular the antimicrobial Aminoglycosides such as gentamicin, vancomycin, netilmicin, amikacin and tobramycin. Many of these have narrow therapeutic windows. Furthermore, the therapeutic ranges established for most drugs are based upon studies performed in adults, and extrapolation of these ranges to paediatric patients, especially to neonates, need validation.

Sepsis is common in neonates and is a major cause of morbidity and mortality. Sixty percent of preterm infants receive antibiotic treatment, 80% of these include treatment with aminoglycosides, such as gentamicin. However, this is limited by the risk of oto- and nephrotoxicity, and therapeutic drug monitoring has a role to play in reducing such risks.

Despite the need for immediate, accurate and reliable drug monitoring, typical service provision is limited and may be on the basis of daily (Monday to Friday), or weekly availability in many healthcare organisations. Contributing factor to this are the availability of skilled staff to perform such tests and limited costly equipment and reagents needed to conduct testing.

Unfortunately all too frequently medical staff must apply post-treatment indications such as response to treatment; suspected resistance; signs of toxicity; to aid decision making when it comes to drug therapy.

The founders of Probe Scientific have always recognised the importance of TDM and indeed the earliest work involving drug measurement using microdialysis in humans were reported by them. Consequently the company is well placed having already gather preliminary data on the measurement of drugs such as levodopa, phenytoin, and others, to satisfy this need.