

Before the product could go into final production it had to be tested on premature babies. Once the team felt that the product was safe then three hospitals were contacted and asked to take part in the testing of Neotrend. Over a period of four months Neotrend was trialled on forty-nine premature babies. The team's confidence in the product was proved when a number of doctors said that the product has saved babies lives and reduced the chance of developing severe handicap.

An example of this is baby Louis who was born weighing only 675 grams, 30 cms long and 14 weeks premature. The Neotrend device was inserted into Louis through his umbilical cord and doctors and nurses were able to monitor his blood gases and protect him from developing a disability or even dying. The result of successes like this have been that everyone involved in the project feels excited and moved by the impact that the product has on the lives of babies and their parents.



4 testing and evaluation

ds4 designing the neotrend monitor



DESIGNING

The Neotrend product was developed because there was a very clear need for a device that would continually measure the amount of oxygen, carbon dioxide and acid in premature babies' blood. It was a product that had been needed for at least 20 years but the technology that was needed was not available. The market potential for such a product was estimated at \$600 million and about 40 companies started to develop a product for this market at about the same time.



1 the venture

Diametrics Medical Ltd, the company that designed Neotrend, has a history of developing products that measured blood gas levels. Before Neotrend they had a product which measured only oxygen through the umbilical cord of a baby and another that measured oxygen, carbon dioxide and acid levels in adults. It was recognised by one of the designers that some of this technology could be used in a product for neonates (premature babies).

The development team had to justify to the company the potential of Neotrend. They asked the following questions:

- was the technology available?
- was there a market for the product?
- why should the company spend money on developing this product?

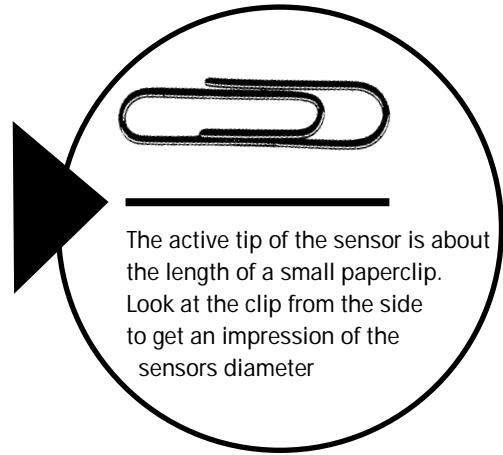
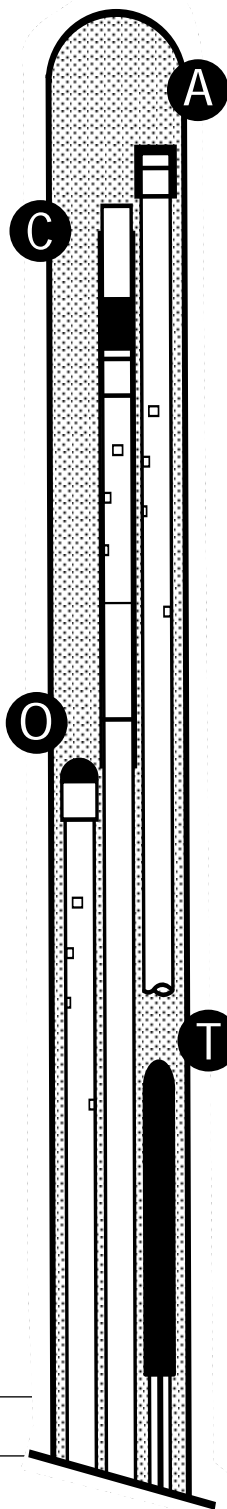
research

The design team and consultants were mechanical engineers, a draughtsman, a process engineer, neonatologists, a chemist and a marketing product manager. Find out what these jobs involve and write about the role that you think they played in the development of Neotrend.

3 designing with new technology

The first step for the team was to design the sensors. The basic idea was already in place; to send light down an optical fibre with a tiny mirror at the end of the fibre; the amount of light reflected by the mirror indicated how much gas was in the baby's blood.

For the oxygen sensor the design team knew that they would need a blue LED. At the time of committing themselves to the design blue LEDs were not available. However, because there was a demand internationally in the computer market for them some companies in Japan were trying to develop blue LEDs. One of these companies was Nichia who the team persuaded to let them have a few of the first batch of blue LEDs ever produced. The team was not afraid to commit themselves to using new, emerging technologies.



2 the specification

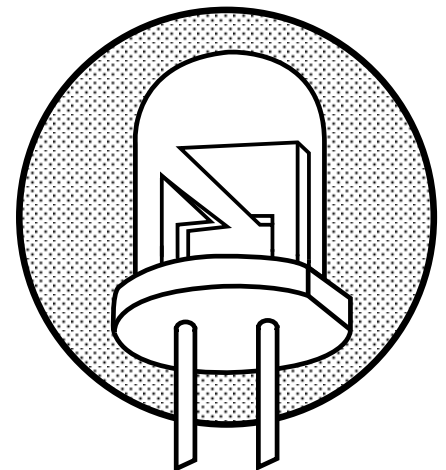
The main specification requirements for the Neotrend device were:

- It should be small enough to fit through a tube that was inserted into the baby's umbilical cord (about 0.5mm in diameter)
- It must have three sensors, one each for measuring oxygen, carbon dioxide and acid levels in the baby's blood. For the sensors to fit inside the device each sensor could not measure more than 0.175mm in diameter

Tiny elements within the sensor measure various aspects of the baby's condition:

- T** Temperature
- O** Oxygen
- C** Carbon Dioxide
- A** Acid

Neotrend uses a blue LED



research

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