



**The Abdus Salam
International Centre for Theoretical Physics**



2140-6

**Workshop on Entrepreneurship for Physicists and Engineers from
Developing Countries**

3 - 7 May 2010

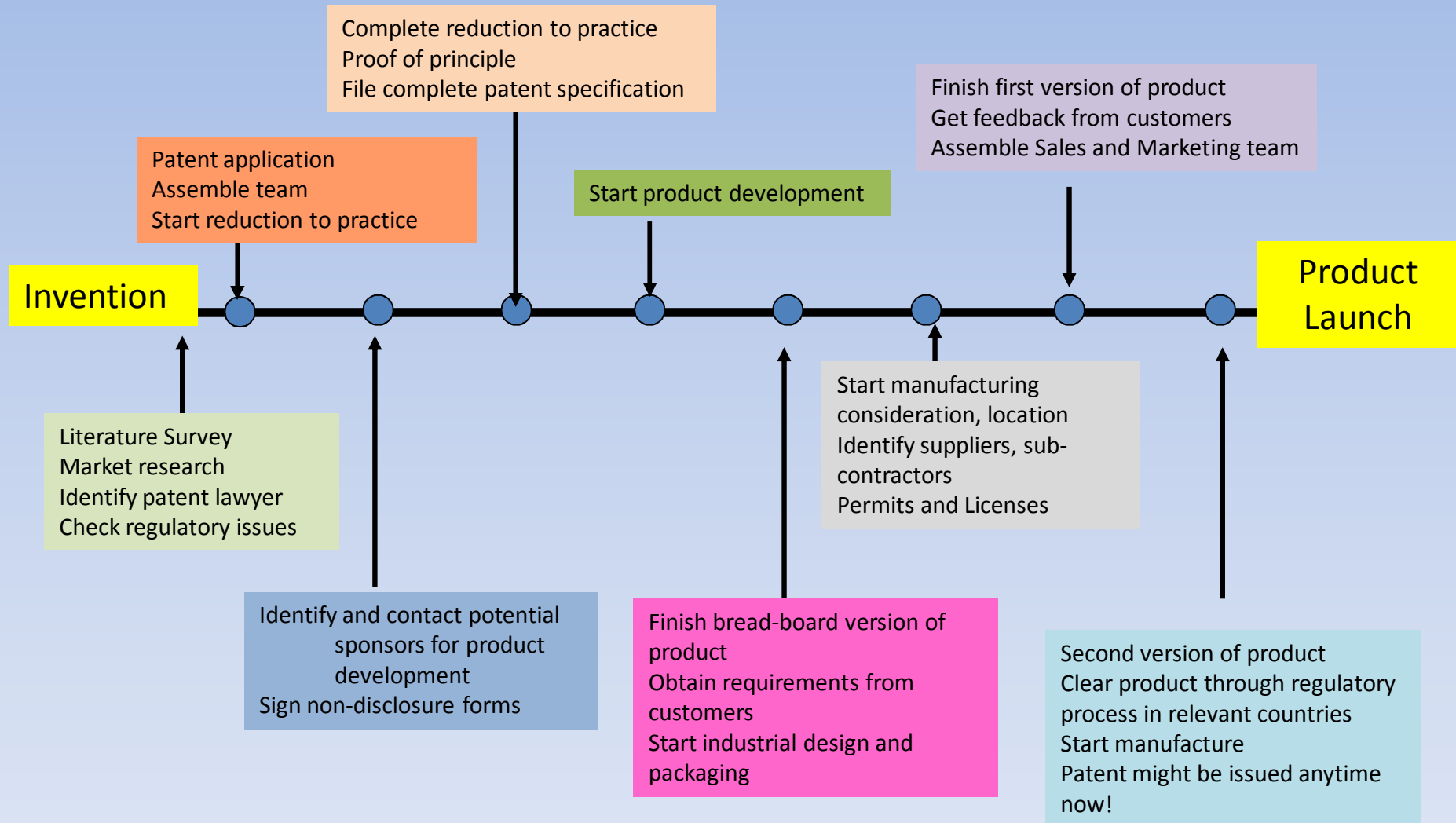
Sell early and sell often

Dawood Parker
Melys Diagnostics
Whitland
UK

Sell Early and Sell Often

Dawood Parker

Stages in the Development of a Product

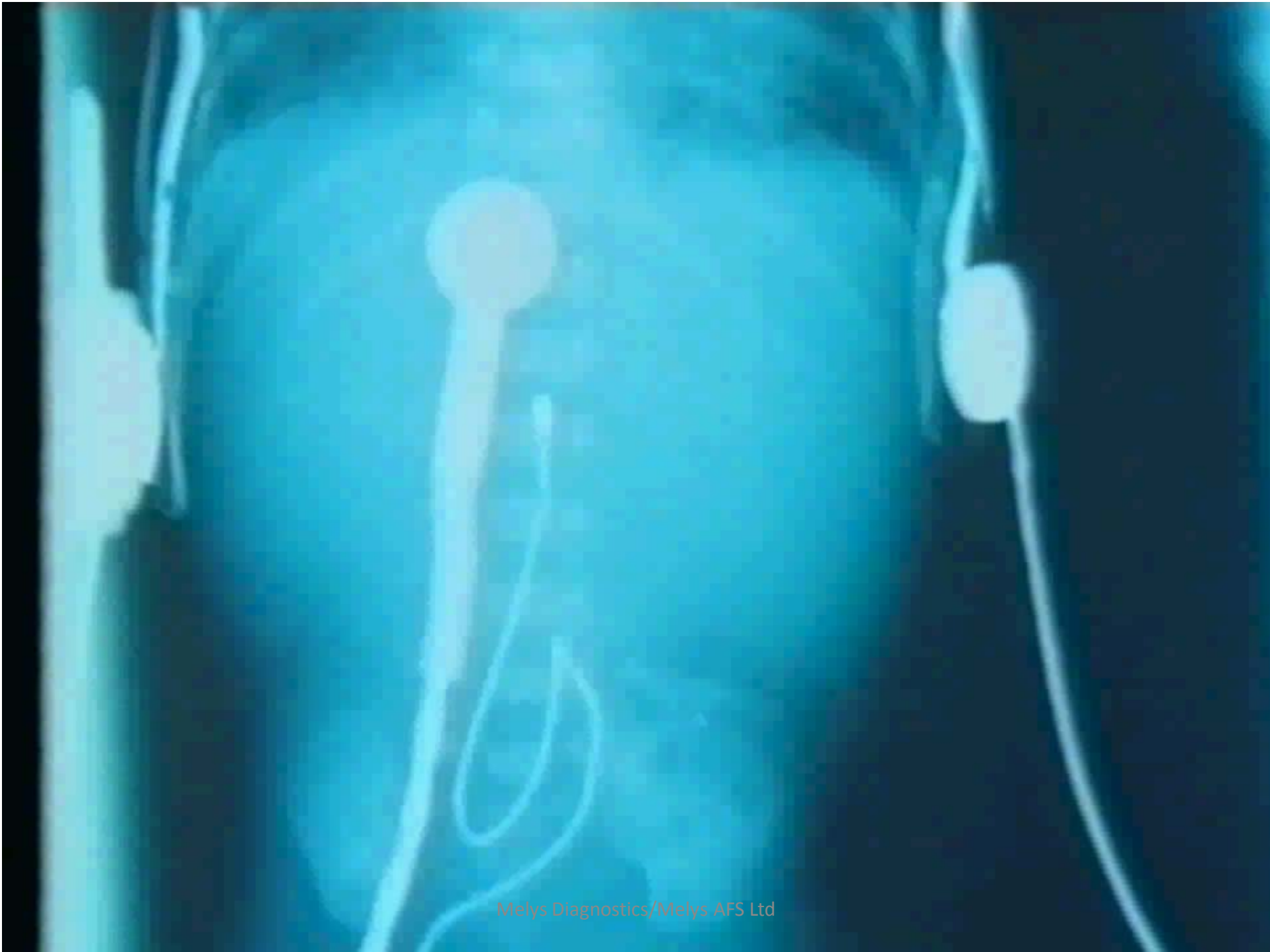


First Development: Catheter-tip Oxygen Sensor.

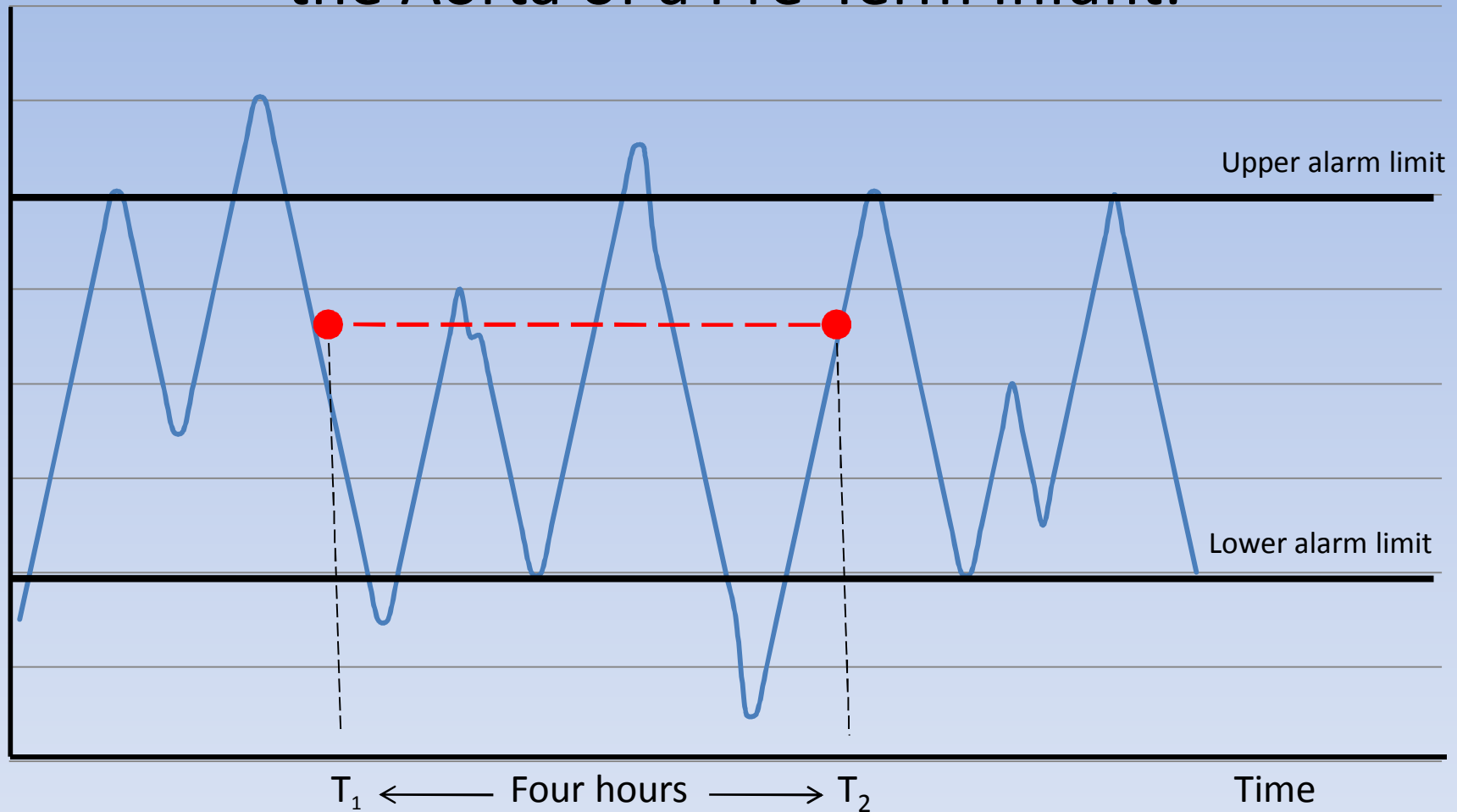
Prior to 1950, the chance of survival for a pre-term baby of less than 1200 grams was zero.



Melys Diagnostics/Melys AFS Ltd



Variation of the Partial Pressure of Oxygen in the Aorta of a Pre-Term Infant.



Applied for patent.

Decision:

Technology sold to a major
pharmaceutical company.

Benefits

- Improved survival rates.
- More than 200 jobs created.

Second Development:

Non-Invasive Combined Oxygen/Carbon Dioxide Sensor

The development of this single sensor enabled oxygen and carbon dioxide partial pressure in arterial blood of pre-term infants to be determined simultaneously through the skin.

Transcutaneous Oxygen and Carbon Dioxide Monitoring System

For continuous monitoring of transcutaneous O_2 and CO_2 partial pressures.

Single transcutaneous Sensor

Measurement of both oxygen and carbon dioxide is performed using a single sensor head.

Simple sensor preparation

Easy 'snap-on' membrane assembly allows user to prepare sensor in seconds prior to calibration.

Calibration using precision gas mixtures

A two point calibration for both oxygen and carbon dioxide allows fine tuning of the system for maximum accuracy.

Direct digital pO_2 and pCO_2 readout

Readouts of transcutaneous pO_2 and pCO_2 are displayed simultaneously on monitor.

Automatic warning of $tcpO_2$ and $tcpCO_2$ fluctuations

Both audible and visual alarms are triggered by values outside of preset limits.

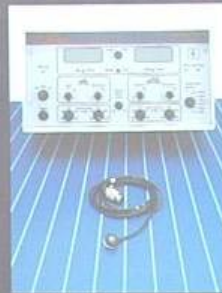
Two completely separate temperature monitoring circuits in combined sensor

Inappropriate power supply to the sensor will automatically cause all power to be shut down to the sensor, eliminating problems associated with overheating.

Battery operated

The monitor utilises rechargeable batteries which are automatically recharged when monitor is plugged into mains supply.

Pictured is the combined transcutaneous sensor which measures oxygen and carbon dioxide simultaneously.



Applied for patent.

Decision:

Technology sold to a major pharmaceutical company.

Benefits

- Ability to monitor newborn infants non-invasively for longer periods of time.
- Number of jobs created.

Third Development: Central Venous Oxygen Saturation Monitor

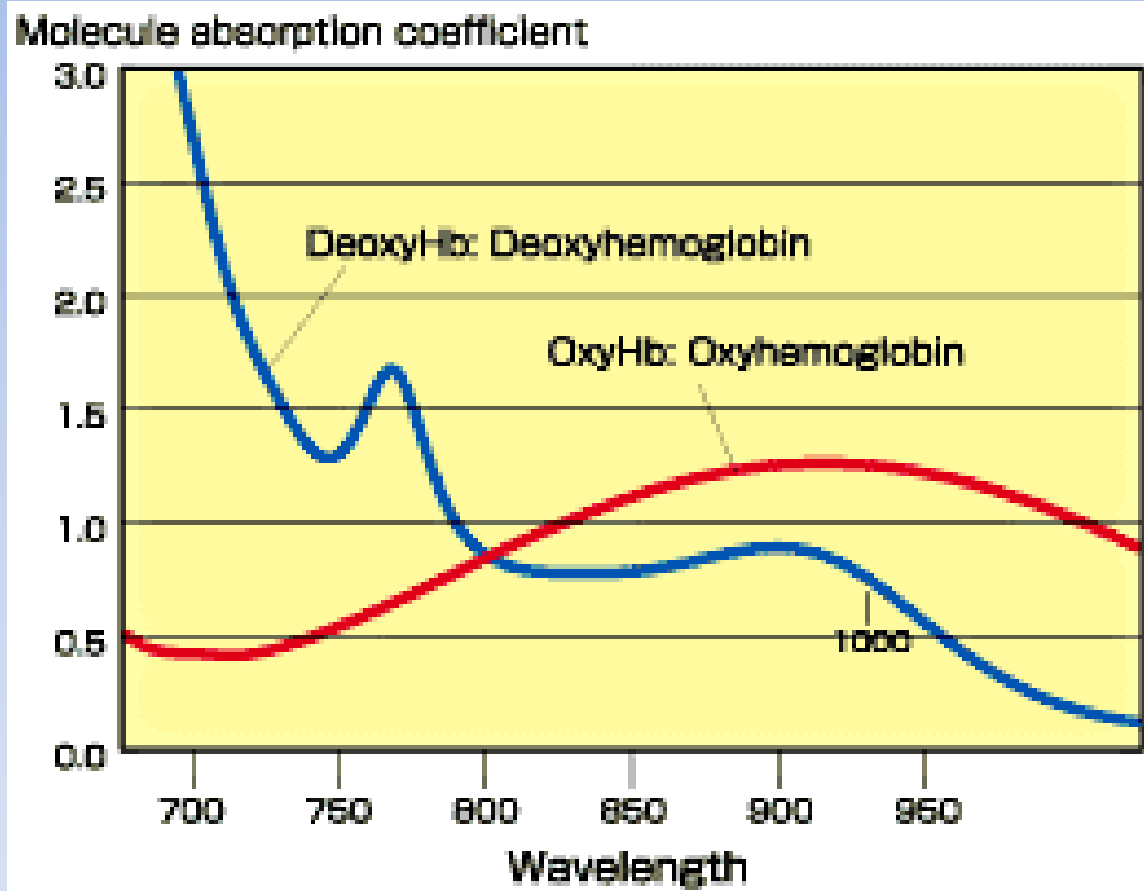
Enabled the oxygen saturation to be measured in the heart of patients with reduced risk and without the need for calibration on the operating table.

Our Technology: Extracorporeal Oxygen Saturation Monitor

O_2 Sat



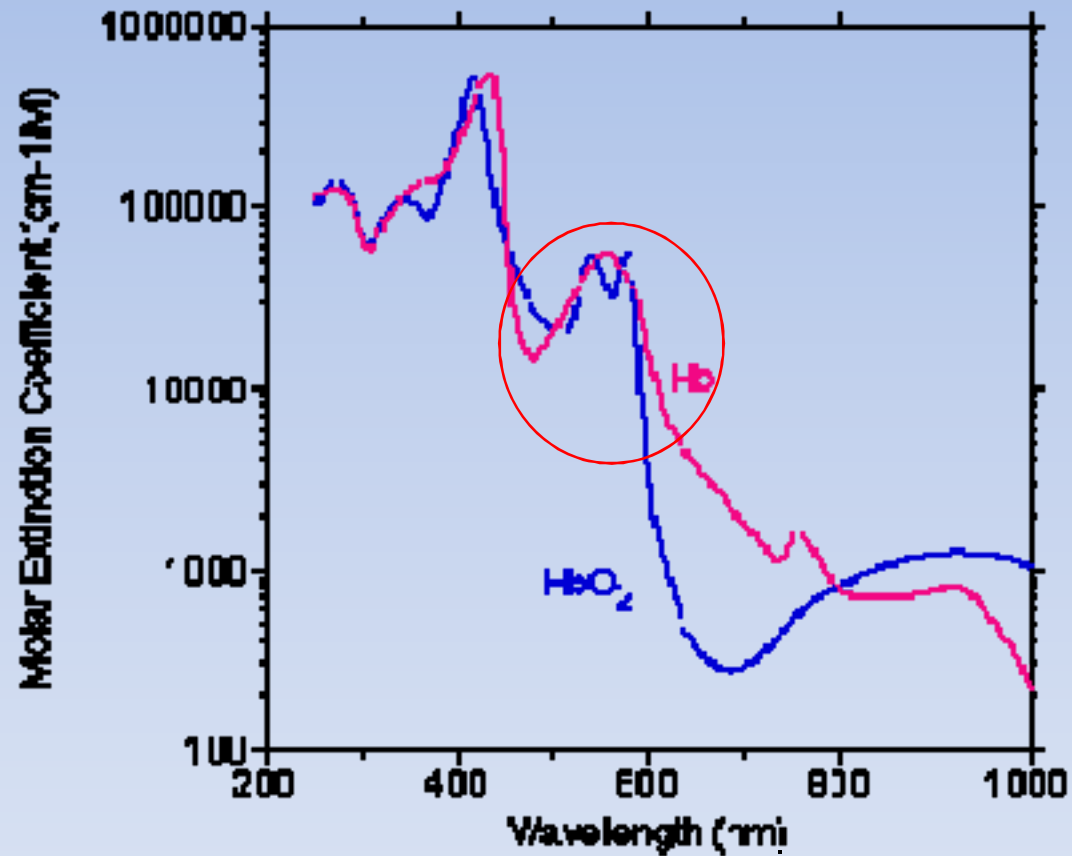
650 & 805 nm



Two wavelengths

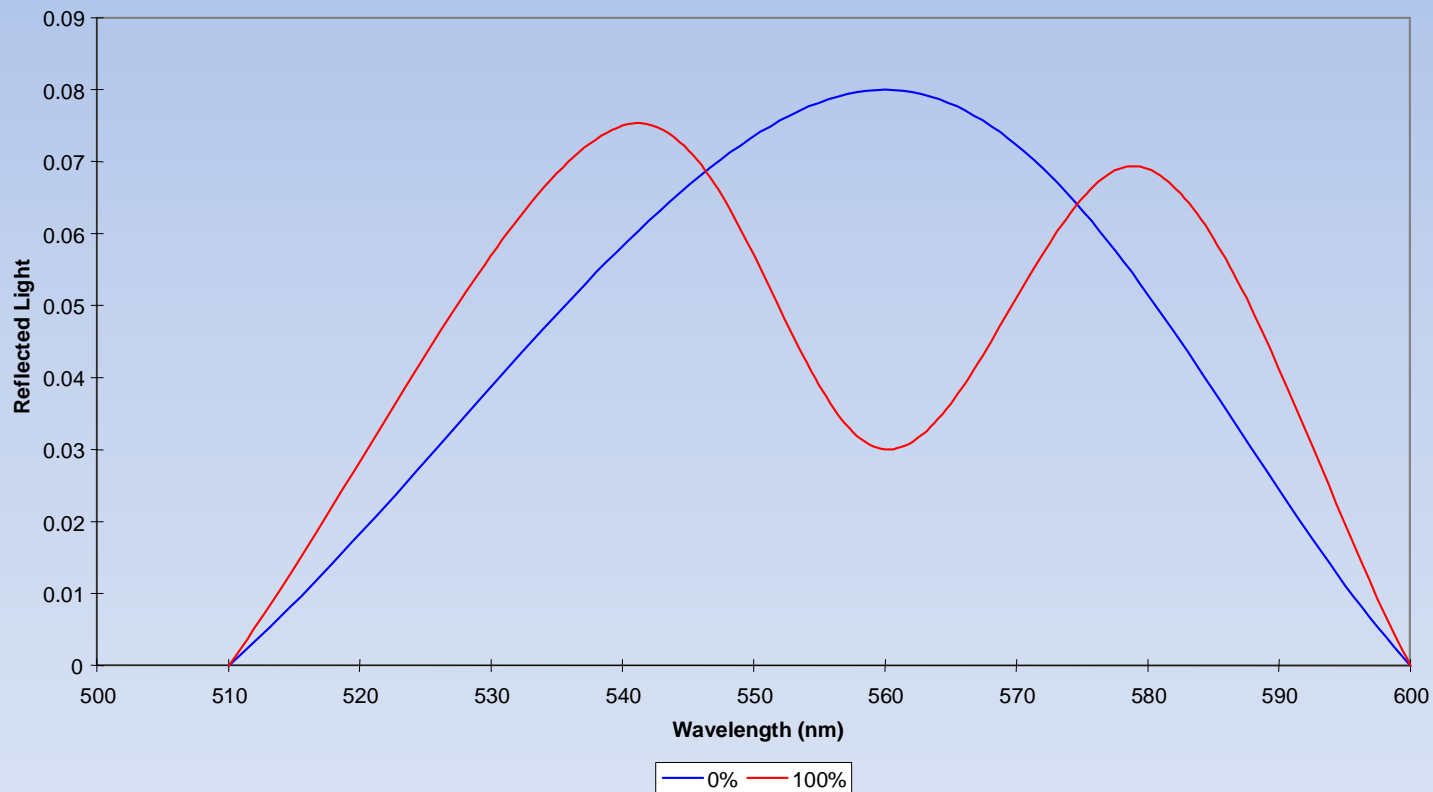
- Transmission only
- Poor signal:noise
- Movement artefact
- Interference from other haemoglobins

Spectrum for Oxygenated and De-oxygenated Haemoglobin.

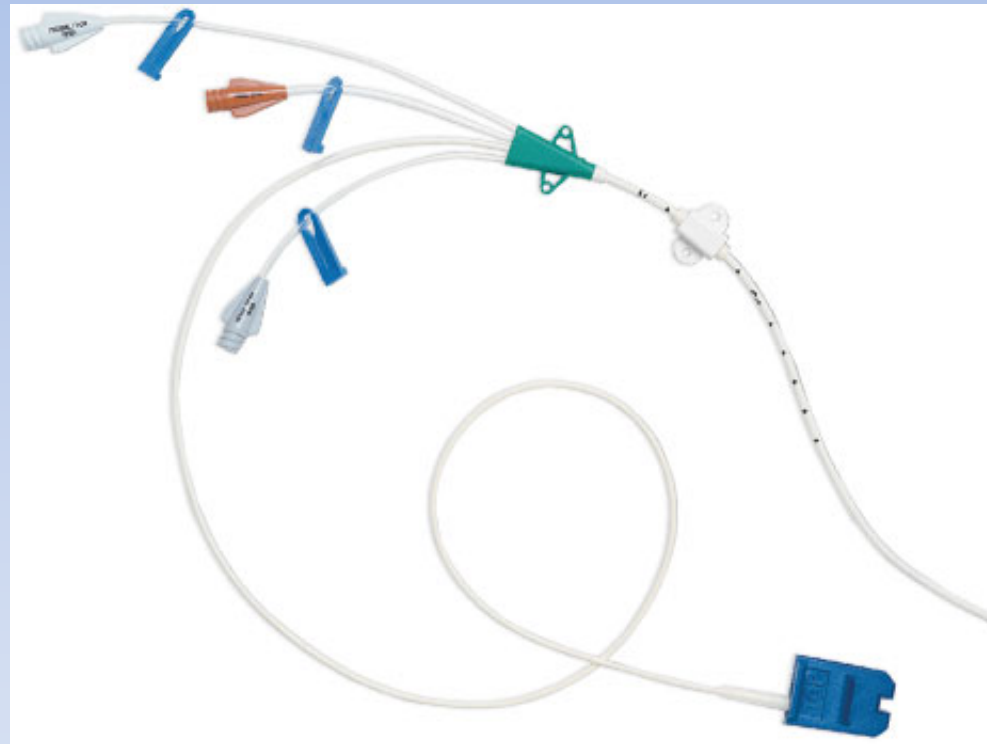


The Double Hump

0% and 100% Oxygenated Haemoglobin Spectra



What we saw: Oxygen Saturation Catheter



By adapting our technology to their invasive catheter we showed that the following advantages could be achieved:

- Calibration free
- Disconnect without loss of calibration
- Lightweight connector
- Cheaper monitoring
- User friendly

Benefits

- Added value to a product which had already achieved a good market penetration.
- Technology acquisition price significant.

Fourth Development: Atrial Fibrillation Screening Monitor

In collaboration with Dr S. Raghu

Atrial Fibrillation Screening Monitor

A screening monitor to identify possible sufferers of Atrial Fibrillation - a condition where the heart beats irregularly and occasionally too fast, leading to inefficient pumping of blood around the body.

Why do we need a screening monitor?

- Many people with AF do not show any symptoms and so go undetected.
- People with AF are at higher risk of having blood clots and subsequent stroke.
- The risk of stroke in these patients can be substantially reduced with the use of warfarin.

Is there a Business Opportunity?

- Find out the market size:
 - Is there a competitive product?
 - Who will buy your product?
 - How much will they pay for it?
- How much will it cost to develop a prototype?

Engineering Prototype 1



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Engineering Prototype 2



- Used for further clinical trials.

Pre-Production Prototype



Melys Diagnostics/Melys AFS Ltd

Decision:

Sell the technology – no.

**DECISION IN THIS CASE WAS TO
GO TO MANUFACTURE, SALES
AND MARKETING.**