Pulse Oximeters

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Pulse Oximeters are Medical Devices used to quickly determine the Oxygen Saturation of Blood. This is done by the uses of sensors, which give of red and infrared light pulses. These sensors use a photo detector to calculate the ratio of oxygenated:deoxegenated blood. About 600 measurements are taken every second. These are then fed into an algorithm in the microprocessor which averages the values over the last 3-6 seconds and gives and updated value every .5 to 1.0 second.

The role of hemoglobin in oxegen transport was first discovered by Hoppe-Seyler in the early 1860s. About ten years later Vierordt first used light as a means of measuring the blood oxygen ratio. These works we rediscovered and continued by Nicolai in the early 1930s Continuing Nicolai's studies Gross discovered the ratio between Red and Infrared Light as the means of measuring the oxygenation of blood. These studies gained interest when it was learned that Pilots where blacking out in dog fights at high altitudes. By the mid 1970s, the first modern devices were available for use in the medical industries. These first prototypes tended to be bulky and fragile. By the early 1980s interest in these devices grew as technology grew. By 1986 it was standard to use these devices in all situations involving anesthesia. Today we have portable models that are small and discrete. The Nonin Onyx for example just clips on the finger of your choice, gives you accurate readings and is quite small.

There are many different probes designed to get reading for people and animals. For people the most common is the Fingertips, but other sites include Toes, ear lobes, noses, and foreheads. For Veterinary Medicine the most accurate site is the tongue, but other sites range from the ears, nose, esophagus to the base of the tail, rectum and toes.

It is now routine for all surgeries and intensive care patients to be regulated with these devices. They are becoming useful in clinical diagnosis of pneumonia. They also may play an important role in regulating oxygen levels of pilots who fly at high altitudes, especially in uncompressed cabins. With the newer models that have Memory Storage Capabilities these are some uses: Overnight Sleep Studies, Flight Assessment, Exercise tests, Domiciliary Oxygen Studies, CPAP/ventilator patients and Video fluoroscopy.

These machines are accurate to about 2-3%. There are various factors that can give inaccurate readings. For Example dirty probes, medical illnesses and conditions, cold extremities cold all affect readings.

This technology has become a pillar in the medical industry and will continue to have new applications as technology pushes these devices to new levels.