Medical imaging has come a long way from the machine that made the first image of Bertha Röntgen’s hand to the highly sophisticated computerized devices available today. Röntgen refused to patent his discoveries and inventions, though invited to do so, on the grounds that such things belonged to humanity, whose use of them should not be restricted. This noble attitude certainly contributed to the rapid development of X-ray technology, although subsequently a large number of patents were filed by others for improvements of his technique. The improvements have been accompanied by rising costs. A hundred years ago, Röntgen complained to his glassblower about the high price and short lifespan of the X-ray tubes he used, but at that time they were about 1000 times cheaper than they are today.

The costs are even higher for the advanced types of medical imaging, in which a number of thin cross-sectional images are taken rather than one single X-ray picture. This technique requires the use of computers, which need a stable power supply and often must be kept in air-conditioned rooms. These needs cannot be met in many parts of the world, and thus millions of people are excluded from these benefits. But things are getting better, and high tech at low cost is no longer a dream.

Mainly because of mass production, computers are becoming cheaper, more powerful, and less sensitive to adverse environmental conditions. Television sets and transistor radios were once rare and expensive but are now found in almost every corner of the world.

Conventional X-ray examination became widely available through the development of rugged, high-quality, low-cost equipment. In a similar fashion, ultrasound imaging devices have been developed which can be used under demanding environmental conditions such as high temperatures, high humidity, and erratic power supply. Even the most sophisticated imaging technique, computerized tomography, is now approaching global distribution. Recent models do not require special power lines or air-conditioning, and can complete a study even when there is a total black-out. Their battery back-up system can be recharged with solar energy collectors when power cuts are prolonged. The latest devices use strong magnetic fields to generate images. The equipment is still extremely expensive both to set up and to maintain, but affordable magnetic resonance imaging machines should be on the market before the turn of the century.

High tech at low cost is therefore possible and, most importantly, low cost does not mean low quality. The current very high prices for modern imaging equipment can easily be cut if minor limitations in speed are accepted. If one considers the time necessary to transport a patient to the nearest major city where one of these devices is available, it may be feasible and more economical to have a somewhat slower imaging device in several district-level hospitals.

A magnetic resonance imaging scanner. This equipment is still extremely expensive to install and maintain, but affordable machines should be on the market by the turn of the century.