

THE SCAN

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X-rays and You.

Since their discovery in 1895 X-rays have become a lot better understood and are now being used in a myriad of ways to benefit mankind. The most direct benefit comes from their use in mammography and the nearly 30% reduction in mortality from breast cancer it has brought about.

A few other uses are to protect our food, collect and analyze data from space, safeguard our borders and by art historians to see if one picture has been painted on top of another, older one.

American College of Radiology
1891 Preston White Dr.
Reston, VA 20191
703-648-8900
info@ACR.org

X-Ray With Your iPod?

There's an app for that!

If you have an iPod or iPhone then you already know that it has add-on app(lication)s, many of them free, that will make it do almost anything. One of the more amazing is the "X-Ray FX2" app which allows you to have your "iPhone or iPod touch double as an amazingly cool X-Ray machine."

With the free version you can appear to X-ray your left hand. But buy the PRO version for a mere 99¢ and you'll be able to "X-ray" your skull, chest, either hand, pelvis, knees, feet and other stuff! Really!

Well.....not really. The app does not use radiation and is not a medical imaging device but uses clever "edge detection"



and templates you select before demonstrating your radiological prowess. So, whaddya expect for 99¢?

There are some great examples of this app on YouTube. Just plug in "ipod xray".

X-Rays Discovered by Accident!

In 1895 German physicist Wilhelm Roentgen was doing some experiments in which he passed an electric current through a vacuum tube fitted with a cathode and an electrode when he noticed that photographic plates nearby began to grow fogged. In an effort to discover why he placed black paper on the tube and then turned the current back on and saw that a nearby screen coated with barium began to glow.

Roentgen came to the conclusion that unknown rays produced inside the tube were passing through the paper to make the fluorescent barium give out light. He named them



"X-rays" since "x" is a scientific symbol for something that is unknown.

He went on to develop X-ray photography and above is the very first picture he took - his wife's hand clearly showing her ring. He was awarded the Nobel prize for physics in 1901 for his discovery and development of X-rays.

This newsletter was produced in conjunction with the American College of Radiology.

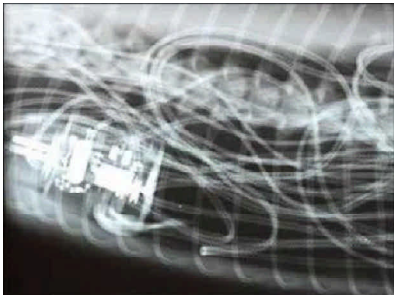
X=Unknown

This scan of an Indiana child's stomach revealed a strange scene.



Apparently the 8-year-old had swallowed 10 magnets and 20 steel balls from a Magnetix toy set which she said later "looked like candy."

You'll never guess what this is...



It seems a pet python had swallowed an electric blanket **whole**, along with the remote control!

This is obviously an X-ray of a tuba. Why? No reason.



What Are X-rays?

Just like radio and light waves, X-rays are electromagnetic waves which travel at the speed of light. However, the wavelength of an X-ray is one hundredth that of visible light rays and have a lot more energy.

All elements emit a characteristic X-ray spectrum when they are bombarded with electrons. We make it happen here on the Earth using an X-ray tube but we also receive X-rays from outer space. Most come from mysterious objects called quasars (quasi-stellar objects) which give out huge amounts of X-ray energy - up to 1,000 times as much energy as an entire galaxy!

Because of X-rays' ability to pass through many forms of matter their use has become widespread in



When a 5-inch knife was plunged into the head of a 16-year old boy during a 2008 attack in South London he was rushed to hospital with the blade still in his head. X-rays, coupled with the resilience of youth saved his life.

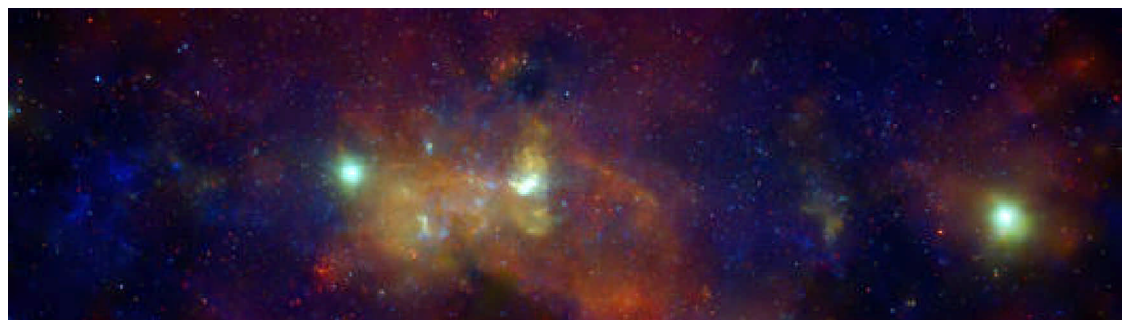
medical applications. The X-ray is turned on briefly (typically less than 1 second) passing easily through skin and flesh, which show up as light areas on the film. They are slowed down by denser material like metal and bone which show as darker areas.

Chandra - Deep Space Sentry



This artist's rendition is of NASA's "Chandra" telescope which can pick up the massive blasts of X-ray radiation released by dying super novae, spinning neutron stars and ravenous black holes.

In the picture below, low-energy X-rays are colored red, medium energy green and high energy blue. The three turquoise spots represent sources of X-ray radiation. The center one is the supermassive black hole Sagittarius A, and the right and left spots are stars feeding material into the black hole.



Launched in July 1999 Chandra was only slated to run for five years, but could continue operating until the next X-ray space telescope goes up in 2020.