Soon all medical scans will look like this. And, incredibly, they could be done by your GP using just a laptop and an Xbox controller. These pictures contain basically the same information as a murky black-and-white photo from a CT or MRI scan. But they look a world away. What makes these so incredibly clear and detailed is that they’ve been fed through a new piece of software wizardry called BodyViz, which owes far more to computer games than conventional medical imaging.

Instead of the flat 2D image usually seen when you are scanned, the BodyViz process uses the information to produce images in full-colour 3D. And while some...
CT scans do produce vivid colour pictures of organs, BodyViz lets surgeons, at the touch of a button, look at different aspects of your body to show only veins, or bones, for example, or to turn the image through 360 degrees.

The program was developed at the Virtual Reality Applications Centre at Iowa State University, one of the most advanced computer research centres in the US. Using it, surgeons can in minutes make preparations for an operation that previously would have taken hours. Working out the safest way into the body is easier, more accurate and therefore less invasive.

“This system allows surgeons to perform virtual operations before doing the real thing,” says Curt Carlson, CEO of Ames, which markets BodyViz. “It lets you swoop through any part of the body as though on a fly-by mission.” So you can travel through organs, and check for, say, early signs of cancer in the colon or blockages in the arteries.

And because BodyViz relies on computer gaming technology that’s already widely used, it only costs about £4,000, and could be available to GPs in a few years.

BodyViz is already transforming the way doctors work. “In the past, I’d go over the scans with the radiologist, but I’d still have to plan, draw pictures, imagine and finally guess at the best approach,” says Dr Thom Lobe, paediatric surgeon at Blank Children’s Hospital, Des Moines, Iowa. “This means that when we open a patient up we’re not entirely sure what we’ll find; sometimes
there are unexpected ob-
structions and you find you’re
flying by the seat of your pants.
BodyViz cuts that out and
speeds things up. I can see in-
stantly what’s happening from
the scan. It means there’s less
chance of any surprises dur-
ing surgery.”

But it’s when surgeons practise
on the patient before operating
that the link with compu-
ter games is most obvious. At
the click of a button on the hand-
held controller—identical to
those used for playing games
on an Xbox—up pops an equip-
ment list. But instead of swords
or laser blasters there are scalpels
and other surgical tools. The surgeons
can plot how they intend to cut or
probe on the body with incredible ac-
curacy. Clear pictures allow the small
incisions used in keyhole surgery to be
made in exactly the right place, and
possible obstructions can be seen
in advance.

The first hospital to install BodyViz
was The Methodist Hospital in Houston,
Texas, last February. Dr Brian Butler,
head of the Radiation Oncology Depart-
ment, explains that working with peo-
ple outside your field brings a whole
new perspective.

“Computer gamers immediately
understand the idea of wanting to
blast one area but protect others
nearby,” he says. “And that’s what we
have to do with radiotherapy: get the
maximum dose to the target and the minimum everywhere else.” Doing that with a 2D image from a conventional scan is tricky. “3D lets us see exactly where each beam goes through the body.”

Already, other hospitals are referring patients to The Methodist for a second opinion before an operation. The scans are projected onto a huge screen. “The graphics are unbelievable,” says Dr Gregory Kolbinger, clinical director of the Iowa Simulation Centre at Des Moines University. “It’s like walking inside the body.” This hyperreal image allows experts from different specialisms to agree on what they’re looking at—not always the case with 2D scans.

BodyViz could also give patients a valuable new insight. “Regular CT scans don’t give cancer patients any idea of what’s going on,” says Dr Brian Butler. “But now doctor and patient can get a sense of what’s happening, and that’s less scary.”

So will BodyViz be used in the UK? “We’ve had systems for presenting 3D scans for some years,” says Richard Evans of the British Society of Radiographers. “But BodyViz’s more sophisticated software results in wonderful, high-quality images. It could play a very useful part in training and in dry runs for operations.”

FRACTURE OF THE PELVIS

This patient has had a serious accident. Top left is a fracture, and there’s more damage where the hip bone joins the pelvis. Blood vessels (not seen) can be shown in a second with a touch on the Xbox controller. If they’re damaged too that will compound the seriousness of the injury. The surrounding organs can also be easily checked. This is much harder to see on X-rays, and with CT scans the surgeon needs the radiologist to interpret, losing precious time in an emergency. Scans such as this are already in certain hospitals and, as the software is relatively cheap, surgeons can run it on their laptops without having to wait to access a central computer.