Myodil is a contrast agent used in a procedure known as MYELOGRAPHY. This involves visualisation of the spinal cord by the injection of contrast material into the subarachnoid space (ie. Into the spinal fluid) through a needle inserted into the back.

Myelography was first used in 1919, when air was injected to produce an *air myelogram*.

In 1922, an oil-based substance called Lipiodol was introduced. This was extremely toxic.

In 1923, Thorotrast came into use, but was radioactive, so carried high risk.

Iophendylate (Myodil in UK, Pantopaque in USA) was investigated as an alternative to lipiodol .

On the basis of only 2 animal experiments,(which both demonstrated significant toxicity), the new medium was first tested clinically on Nov. 1940.

It came into common usage in 1942 and went on to become the agent of choice between 1944 and 1972 in the UK.

However, at the same time as Myodil was coming into use, an eminent neurologist, Eric Oldberg, wrote a paper entitled "A Plea for Respect for the Tissues of the Central Nervous System" in which he warned of the dangers of introducing foreign material into the delicate areas around the spinal cord or brain.

He specifically mentioned Lipiodol as being "harmful" and stated:

"Anyone who has had perforce to dig about in the soggy mess which is the cauda equina of some unfortunate in whom five or ten cubic centimeters of lipiodol had been optimistically injected a year or two previously will understand this statement.

Not only is the original disease present, but a chronic, adhesive, chemical inflammation of the caudal roots has been engrafted upon it."

Nor was Myodil to turn out to be any less toxic. In 1950, a paper by Jaeger was published in a highly reputable journal. (Archives of Neurology and Psychiatry) Jaeger stated that

"ethyl iodophenylundecylate (Myodil) is *extremely toxic"*, even suggesting that it was

"much more irritating than similar emulsions..previously used."

Indeed, the use of Myodil in Sweden was discontinued in the early 50s.

In 1954, an article was published in *The Journal of Bone and Joint Surgery* , printed both in Boston and London: it concluded that

"Pantopaque (Myodil)..and other iodized materials may contribute to severe and disabling arachnoiditis."

However, in the UK, use of this agent continued into the late 80s, well over 30 years later.

In 1977, The International Society for the Study of the Lumbar Spine met in Utrecht, Holland, and issued a Summary Statement on the use of myelographic agents;

this stated that radio-opaque myelographic media are known to be associated with recognised potential adverse events and called for a

"major reappraisal of the present medical and surgical approach to Lumbar disc disease."

The Society stressed that

"Emphasis must be placed on the most innocuous myelographic agents"

(by now, water-soluble agents were available) and also

"on the development of noninvasive means of diagnosing disease of the Lumbar spine."

In 1978, a paper by Johnson et al cited a 74% incidence of serious adverse effects due to Myodil.

A further important point is the necessity of aspirating (removing) the oil-based agent after the procedure; whilst some authors have argued that the trauma of the removal itself constitutes a hazard, nevertheless, most agree that aspiration is necessary to reduce the amount of agent left within the system.

One of the leading experts, Dr. Charles Burton of the Institute of Low Back and Neck care, wrote in 1999:

"non-traumatic removal should be accomplished as soon as possible." Burton estimates that 5% of cases of local inflammatory reaction to the dye "progress in intensity and scope to produce severe disability relating to direct nerve injury."

He goes on to remark that

"The clinical symptoms of this are a remarkably cruel and incapacitating type of pain."

Burton maintains that the use of Myodil has been responsible for serious health problems over the last 50 years.

Lynne McTaggart, in her book, "What Doctors Don't Tell You" published in 1999, wrote about the soft tissue and organ damage that could result from the use of Myodil.

This included anaphylactic (severe allergic reaction) shock, cardiac instability and disorders of kidney function. She also asserted that diabetic patients are at particular risk, with nearly 1 in 10 patients who underwent Myodil myelography ending up requiring dialysis.

Until the 1980s, nearly half a million myelograms were carried out each year in the United States.

Myodil remains in the central nervous system, either persisting as a thin film or encapsulated in scar tissue.

This occurs anywhere along the cerebrospinal axis, (around the brain and spinal cord) and it is quite common for deposits of Myodil to collect in the basal cisterns at the base of the skull.

Being hyperbaric, gravity tends to draw Myodil remaining in the system after the myelogram downwards from other parts of the spine to collect in the lumbosacral area, i.e. the bottom third of the spinal cord.

This is the site for many of the resulting problems, although it should be noted that the chronic inflammatory reaction caused by Myodil, and the scarring it produces, can lead to secondary effects throughout the body.

When one considers that if Myodil is left in a styrofoam cup overnight, it will dissolve the cup, it is hardly surprising that serious toxicity arises in the body.

Indeed, Glaxo Wellcome issued guidance on its use as long as 20 years ago: to whit that glass syringes must be used as plastic syringes would be melted by the substance, and there has been incidences of spillages eating into laboratory floors.

One must also note that the water-soluble contrast agents which superseded Myodil, particularly after its withdrawal in 1987, are not without risks, including the risk of arachnoiditis.

During a survey of arachnoiditis patients in 1999, there were a number of cases of thyroid disease which occurred following myelography. This is quite feasibly linked to the dye, as most myelographic agents contain iodine.