



Ethics, Uncertainty *and* Radiation Protection Culture in Medicine

Professor Jim Malone

Trinity College Dublin



Features of Science/Medicine

- **Dark Side:**
 - Fraud/Misuse*
 - Incomplete Knowledge.*
- **Good Side:**
 - Imagination/Genius*
 - Ethical Application*

Need to work out of both the strengths and the weaknesses

MMR Vaccine Case

- Andrew Wakefield et al suggest link between the vaccine and autism/bowel problems.
- Twelve years later Wakefield struck off, following 217 days of hearings.
- Biased recruiting; undisclosed negative findings; ethical clearance; and undeclared financial interests.
- Paper withdrawn by Lancet 2010.
- ?Practices re authorship?
- Fraud, Errors, Plagiarism, PLOS Fabrication, Non reproducible results.



Early report

Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children

A J Wakefield, S H Murch, A Anthony, J Linnell, D M Casson, M Malik, M Berelowitz, A P Dhillon, M A Thomson, P Harvey, A Valentine, S E Davies, J A Walker-Smith

Summary

Background We investigated a consecutive series of children with chronic enterocolitis and regressive developmental disorder.

Methods 12 children (mean age 6 years [range 3–10], 11 boys) were referred to a paediatric gastroenterology unit with a history of normal development followed by loss of acquired skills, including language, together with diarrhoea and abdominal pain. Children underwent gastroenterological, neurological, and developmental assessment and review of developmental records. Ileocolonoscopy and biopsy sampling, magnetic-resonance imaging (MRI), electroencephalography (EEG), and lumbar puncture were done under sedation. Barium follow-through radiography was done where possible. Biochemical, haematological, and immunological profiles were examined.

Findings Onset of behavioural symptoms was associated, by the parents, with measles, mumps, and rubella vaccination in eight of the 12 children, with measles infection in one child, and otitis media in another. All 12 children had intestinal abnormalities, ranging from lymphoid nodular hyperplasia to aphthoid ulceration. Histology showed patchy chronic inflammation in the colon in 11 children and reactive ileal lymphoid hyperplasia in seven, but no granulomas. Behavioural disorders included autism (nine), disintegrative psychosis (one), and possible postviral or vaccinal encephalitis (two). There were no focal neurological abnormalities and MRI and EEG tests were normal. Abnormal laboratory results were significantly raised urinary methylmalonic acid compared with age-matched controls ($p=0.003$), low haemoglobin in four children, and a low serum IgA in four children.

Interpretation We identified associated gastrointestinal disease and developmental regression in a group of previously normal children, which was generally associated in time with possible environmental triggers.

Lancet 1998; 351: 637–41
See Commentary page 611

Inflammatory Bowel Disease Study Group, University Departments of Medicine and Histopathology (A J Wakefield *rics*, A Anthony *ms*, J Linnell *phd*, A P Dhillon *msc*, S E Davies *msc*) and the **University Departments of Paediatric Gastroenterology** (S H Murch *msc*, D M Casson *msc*, M Malik *msc*, M A Thomson *rcp*, J A Walker-Smith *rcp*), **Child and Adolescent Psychiatry** (M Berelowitz *rcp*), **Neurology** (P Harvey *rcp*), and **Radiology** (A Valentine *rics*), **Royal Free Hospital and School of Medicine**, London NW3 2QG, UK

Correspondence to: Dr A J Wakefield

Introduction

We saw several children who, after a period of apparent normality, lost acquired skills, including communication. They all had gastrointestinal symptoms, including abdominal pain, diarrhoea, and bloating and, in some cases, food intolerance. We describe the clinical findings, and gastrointestinal features of these children.

Patients and methods

12 children, consecutively referred to the department of paediatric gastroenterology with a history of a pervasive developmental disorder with loss of acquired skills and intestinal symptoms (diarrhoea, abdominal pain, bloating and food intolerance), were investigated. All children were admitted to the ward for 1 week, accompanied by their parents.

Clinical investigations

We took histories, including details of immunisations and exposure to infectious diseases, and assessed the children. In 11 cases the history was obtained by the senior clinician (JW-S). Neurological and psychiatric assessments were done by consultant staff (PH, MB) with HMS-4 criteria.¹ Developmental histories included a review of prospective developmental records from parents, health visitors, and general practitioners. Four children did not undergo psychiatric assessment in hospital; all had been assessed professionally elsewhere, so these assessments were used as the basis for their behavioural diagnosis.

After bowel preparation, ileocolonoscopy was performed by SHM or MAT under sedation with midazolam and pethidine. Paired frozen and formalin-fixed mucosal biopsy samples were taken from the terminal ileum; ascending, transverse, descending, and sigmoid colons, and from the rectum. The procedure was recorded by video or still images, and were compared with images of the previous seven consecutive paediatric colonoscopies (four normal colonoscopies and three on children with ulcerative colitis), in which the physician reported normal appearances in the terminal ileum. Barium follow-through radiography was possible in some cases.

Also under sedation, cerebral magnetic-resonance imaging (MRI), electroencephalography (EEG) including visual, brain stem auditory, and sensory evoked potentials (where compliance made these possible), and lumbar puncture were done.

Laboratory investigations

Thyroid function, serum long-chain fatty acids, and cerebrospinal-fluid lactate were measured to exclude known causes of childhood neurodegenerative disease. Urinary methylmalonic acid was measured in random urine samples from eight of the 12 children and 14 age-matched and sex-matched normal controls, by a modification of a technique described previously.² Chromatograms were scanned digitally on computer, to analyse the methylmalonic-acid zones from cases and controls. Urinary methylmalonic-acid concentrations in patients and controls were compared by a two-sample *t* test. Urinary creatinine was estimated by routine spectrophotometric assay.

Children were screened for antiendomysial antibodies and boys were screened for fragile-X if this had not been done



Retraction

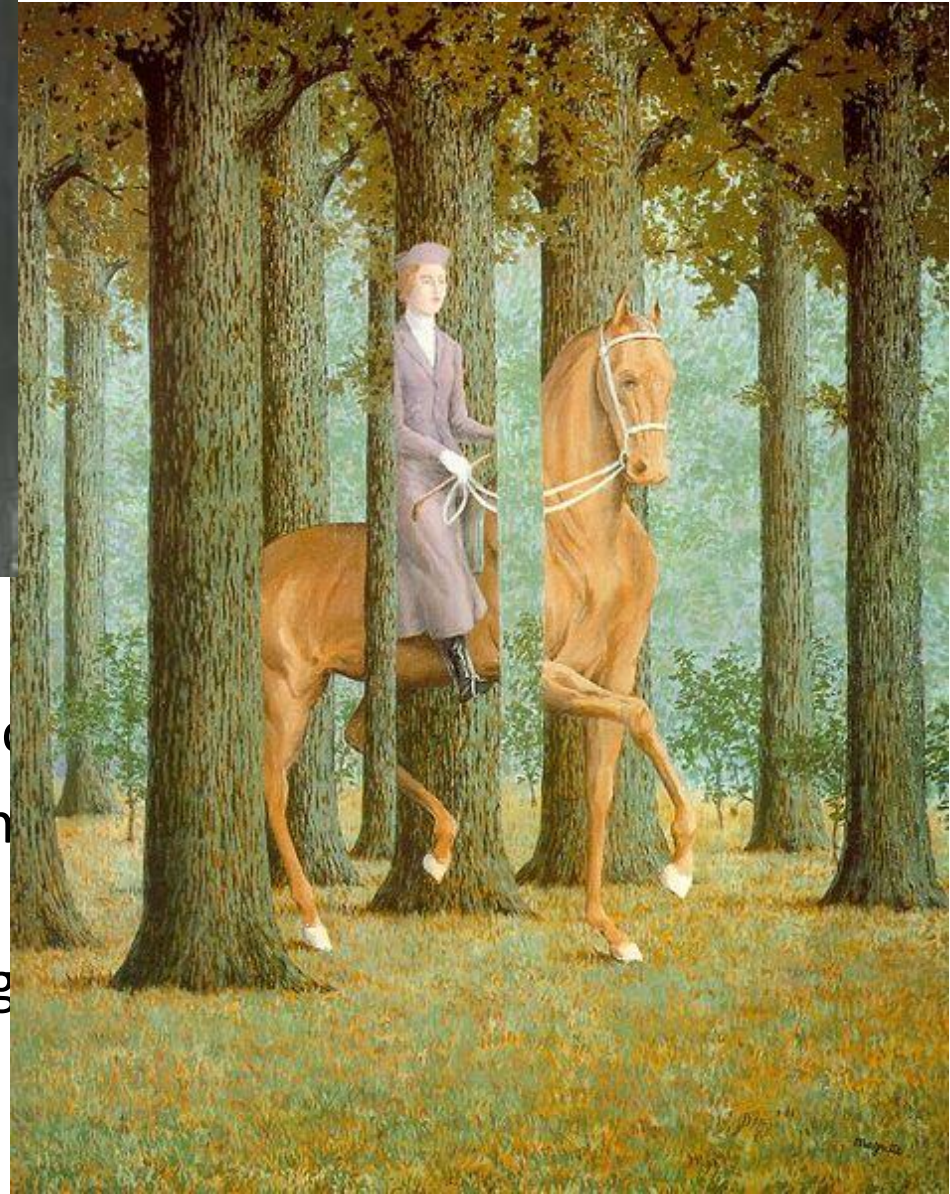
- Publication Process riddled with problems; hard to replace (Richard Smith) Criminal

Example 2:

- Japanese. Jan 2014. ***Nature***: reprogramming of adult cells to stem cells. Mega deal.
- Other scientists raised issues; eg, with images in paper
- Multiple authors and Difficulties repeating work
- Haruko Obokata disciplined for inappropriate behaviour. Others walked (but not all).
- Retraction by journal Jun 14.



Misuse and Missapplication



Misapplications/Misuse

- Unnecessary and Inappropriate Labels
- UN/EC: Systemic inappropriate examination of potential harm.
- Lifestyle advice re dairy fats and eggs
- Mammography controversies.

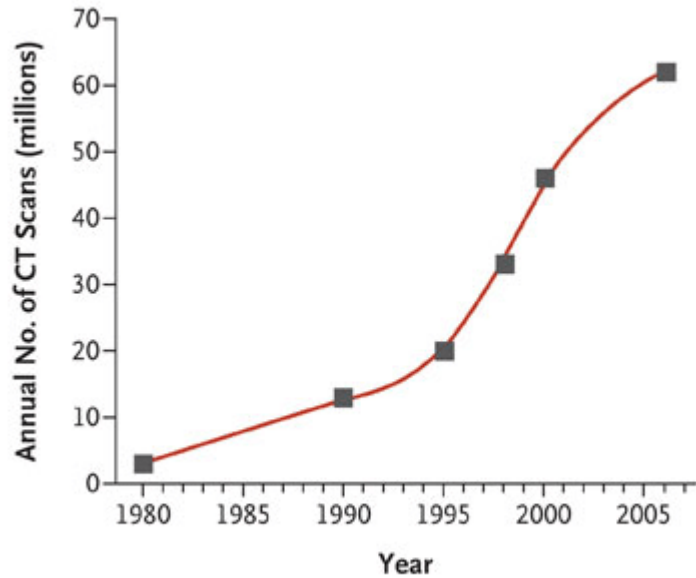
Medicalisation/Overtreatment: Damien Hirst

- Obsession with medicines replaced God/Religion
- Instruction/advice, from on high, on how to live
- Pharma products (like religion) attractively packaged and potentially lethal



Trusting Artists and Poets

Existing information not known/acted on?



Thallium Scan Dose	
Chest X-Rays	%Cardiologists
0.5	9
1	13
3	49
500	29

3 mSv, 2009

0.4 mSv,
2000

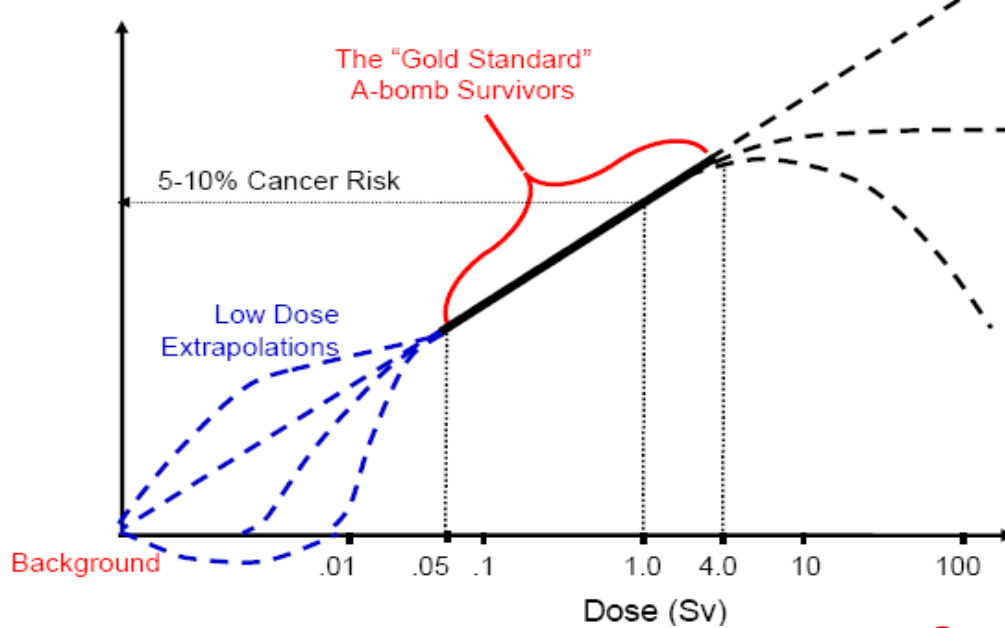
Knowledge Base Incomplete/LNT

Brian Friel

- ---- *But remember that words are signals ----- . And – it can happen that a civilization can be imprisoned in a linguistic contour which no longer matches the landscape of -- fact*

• Skeptics and Risk

- Reflexivity/deliberation is essential in science and communications of RP



uncertainty

Different levels
of effect

complexity

fundamentalism

randomness

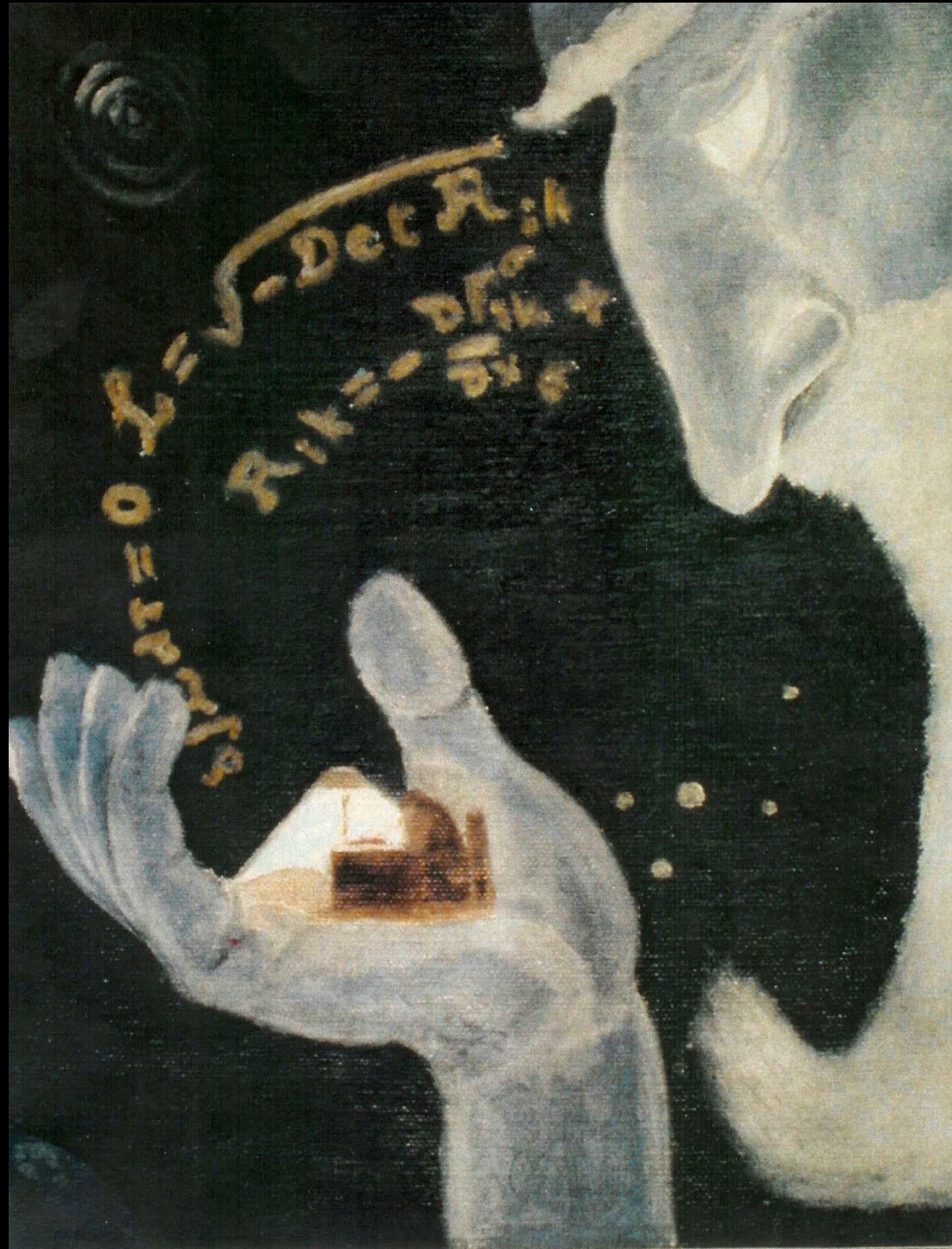
interpretation

**Confusion is not
an ignoble condition**

C
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Reflection/Contemplation in Science

Lessons from a Painting of Schrodinger



Ethics, ICRP and RP in Medicine

- ICRP purpose built for radiation; incomplete overlap; detached from mainstream medical ethical scholarship and practice
- Move from paternalism; Trend towards ethics/oversight
- Medical system comprehensive; strong scholarship; ignores radiological; also has problems
- RP, by being separate , has advantages,
- But is isolated with low recognition in medicine.
- Positions of some professional bodies



Ethics: Values for Radiology

Core

Values

**Autonomy and
Dignity**

**Non-
Maleficence
&
Beneficence**

Justice, etc.

One to One, every
day. Often in
context of personal
crisis for patient

Additional Values

**Prudence:
Precautionary
Principle**

**Honesty
Openness,
Transparency**

**Contemporary
Social
Expectations**

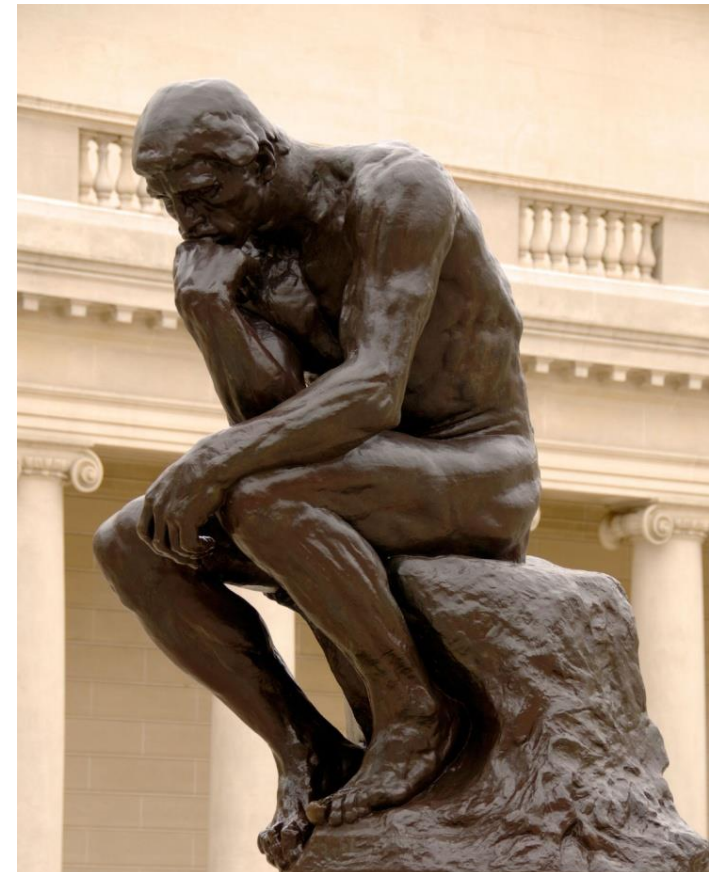
VALUES acceptable to theorists
from diff schools.
Cherished globally in all Cultures
ICRP and Precaution



Scenarios 2: Orthopoedic Clicic

Autonomy Dignity	Non Maleficence Beneficence	Justice	Prudence Precaution	Honesty Openness
-	(y)	(y)	-	-
N	N	N	N	N

- Orthopoedic surgeon Mr A, public clinic in hospital Y, weekly. New, follow up. Injuries and elective.
- He insists every patient attends be sent to radiology by the nurse, and will not see a patient without a film folder from radiology.
- Similar for insistence on pre op Chest
- Tallaght Incident/ Pre Op chest



Scenarios 4: IHA/Self Referral

Autonomy Dignity	Non Maleficence Beneficence	Justice	Prudence Precaution	Honesty Openness
Y	-	-	-	Y
N	N	N	N	N

- Dr B, Interventional Cardiologist.
Private rooms with imaging facility.
- Explains the radiation (and other) hazards of procedures.
- Explains radiation risk is unproven.
- **IHA** and unreferred worried well
- Procedure on request w consent
- Fee for consultation + for imaging.
- Dr B is shareholder in facility.



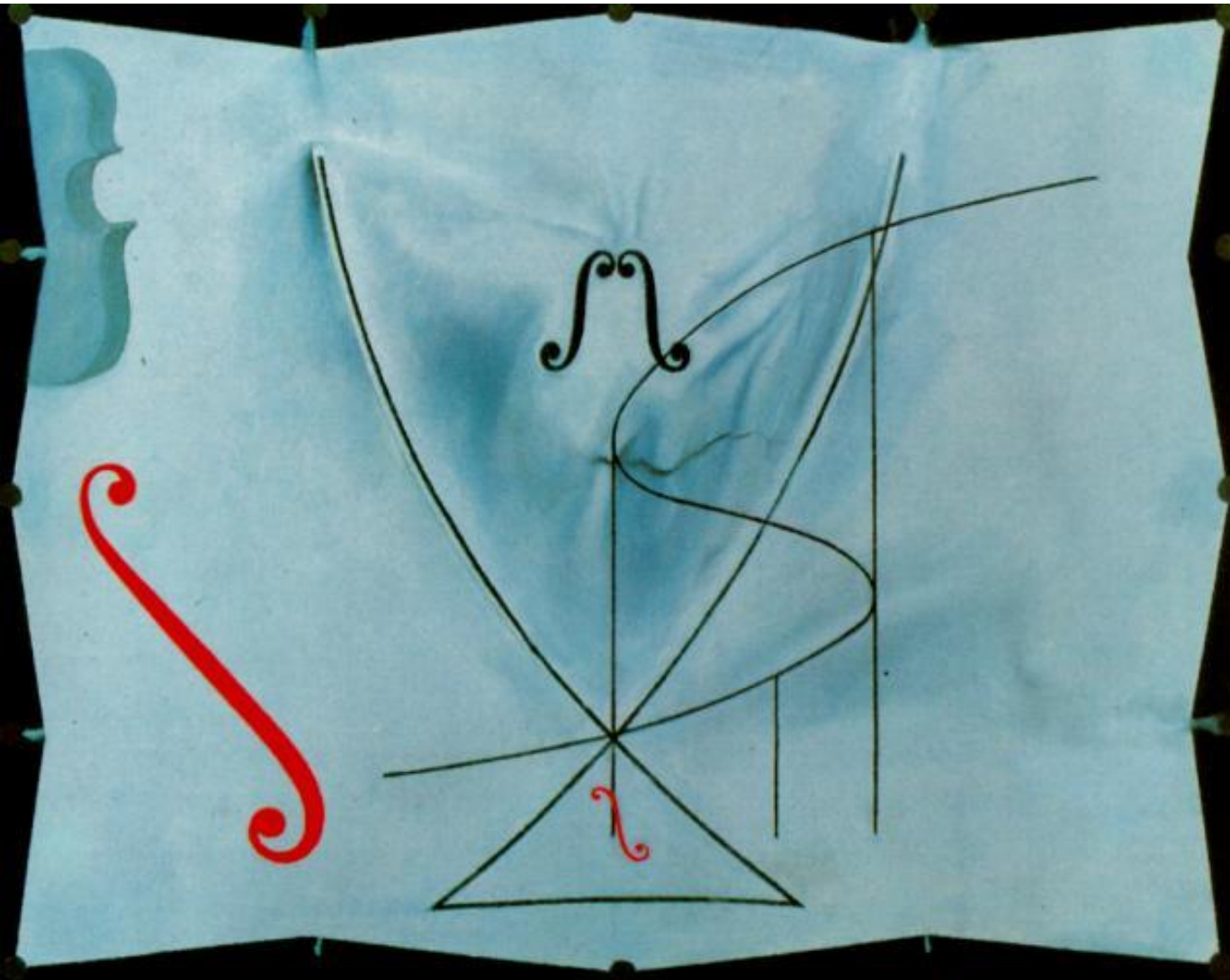
Scenario 5: Paediatric Patient

- Child (2y old boy), presents for whole body CT.
- Dr P, paediatric radiologist, she believes examination is justified and should be performed promptly.
- Parents request information on cancer risks. Dr P responds nothing to worry about. She deflects further questions; explains her department is the best.
- Full explanation takes too long; she fears parents may withdraw the child from a necessary examination.
- Technically excellent examination performed.



Autonomy Dignity	Non Maleficence Beneficence	Justice	Prudence Precaution	Honesty Openness
Y	-	-	-	-
N	Y	Y	Y	N

WB Yeats – 150: *All changed, changed utterly ---?*



Background
Inspiration, fraud,
poor use, **values**,
professional life
and culture of RP

Objective: deal
with **Radiation**
and the **People**,
one to one with
empathy + with
social
engagement

