RP Challenges in Science and Application (Ethics)

ICRP Publication 138: Ethical Foundations of the System of Radiological Protection

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★ Significant contributions from Jacques Lochard and Christopher Clement
To clarify the ethical basis of the system of RP
To bring awareness about the ethical aspects of RP to both the interested public and RP professionals
Aims to communicate the “whys” of the system with the public and professionals as well as to help strengthen the basis of the recommendations
Radiation protection is not only a matter for science. It is a problem of philosophy, and morality, and the utmost wisdom.


- ICRP 138 is a foundational publication for discussion of ethical aspects of RP
- Now more clearly reflects the necessity of value judgements in interpreting risk and making appropriate decisions
Historical Context

• Influence of scientific developments
• Influence of changes in societal and cultural attitudes
• Influence of different applications – medical, energy, accidents…
SCIENCE

Descriptive claims, i.e. the way it is
Understanding of the physical or material world
Scientific principles

ETHICS

Grounded in reason and human experience
Systematic pursuit of the truth
Justification of claims

Normative claims, i.e. the way it should be
Understanding of moral concepts
Moral principles
Foundational Ethical Theories

**Consequentialism**
- Emphasis on consequences of actions
  - Utilitarian ethics: Greatest good for greatest number of people

**Deontology**
- Emphasis on the nature of the act and intent
  - Kantian ethics: responsibility to treat others with respect as they have inherent value

**Virtue ethics**
- Emphasis on being a responsible human being
  - Ethics of aspiration: striving for excellence of character in life

- What are potential consequences, both short and long term?
- Are the consequences positive or negative?
- Does the action respect the rights of persons?
- Consider the various stakeholders
- How does this effect (or what does the action say about) the character of a person?
- Consider various roles and responsibilities
Values Underpinning the System

- **Four core ethical values**
  - Beneficence/non-maleficence
  - Prudence
  - Justice
  - Dignity

- **Three procedural values**
  - Accountability
  - Transparency
  - Inclusiveness
The use of radiation can have desirable consequences, which are weighted against the harmful consequences.

A key challenge is how to measure the benefits, harms, and risks.

Determination of what “counts”

Relates directly to the principle of justification.

“Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (WHO 1948)
Balancing benefits and risk is one of the most common ethical dilemmas.

Prudence is the virtue of careful deliberation and good judgment without full knowledge of consequences.

- Describes the way in which decisions are made, and not solely the outcome of those decisions.
- NOT necessarily the lowest risk option.
- Relates directly to the principle of optimization.

“The Commission considers that the LNT model remains a prudent basis for radiological protection at low doses and low dose rates...[and] is considered by the Commission to be the best practical approach to managing risk from radiation exposure” (ICRP 103)
Justice

- **Balance** that allows making inequalities acceptable when equality is not a reasonable solution
- Various categories (distributive, restorative, procedural…)
- Protection criteria reflect personal circumstances and equal treatment with regard to higher levels of exposure
- Relates directly to the principle of **limitation**: ensuring that exposures do not exceed the level of risk deemed tolerable by society and recognized by law

“When the benefits and detriments do not have the same distribution through the population, there is bound to be some inequity. Serious inequity can be avoided by the attention paid to the protection of individuals.” (ICRP 60)
**Dignity**

- **Right to know**: refers to the type of information that affected persons should receive to make informed and effective decisions.
- **Informed consent**: the process for getting permission before conducting a healthcare intervention on a patient.
- **Self-help**: the capacity of individuals facing a risk to protect themselves.
- **Practical radiation protection culture**: the knowledge and skills enabling citizens to make choices and behave wisely in situations involving potential or actual exposure to ionizing radiation.

*Human dignity “recognizes the need for the respect of individual human rights, and for the consequent range of human views”* (ICRP 91)
**Cross-Cultural Relevance**

**Beneficence/non-maleficence**

A man is not great because he is a warrior or kills other men, but because he hurts not any living being (Dhammapada 270)

Whenever we have the opportunity, let’s practice doing good to everyone (The Bible, Galatians 6:10)

Into whatsoever houses I enter, I will enter to help the sick, and I will abstain from all intentional wrong-doing and harm (Hippocratic oath)

**Dignity**

Every human being without distinction…possesses an inalienable and untouchable dignity (Parliament of World’s Religions, 1993)

All human beings are born free and equal in dignity and rights (Universal Declaration of Human Rights, 1948)

In a Brahma…and an outcast, the wise see the same thing (The Bhagavad Gita 9:32)

**Prudence**

Act like a person in fear before the cause of fear actually presents itself (The Mahabharata 12:138)

The cautious seldom err (Analects IV:23)

Those who are prudent see danger and take refuge, but the naïve continue on and suffer the consequences (The Bible, Proverbs 27:12)

**Justice**

He who is equal-minded among friends, companions and foes…among saints and sinners he excels (The Bhagavad Gita 6:9)

Whenever you judge between people [do so] with justice (The Quran 4:58)

No light can compare to the light of justice. (Bahá’u’lláh, Epistle to the Son of the Wolf, 53)
The fundamental standpoint of Confucianism is that all humans have a disposition towards the good, and are naturally inclined to follow the virtuous model. The five moral values (or virtues) that are embedded in Confucianism are: Ren (benevolence), Yi (justice), Li (courtesy), Zhi (wisdom), and Xin (trust).
Tolerability and Reasonableness

- The ICRP System of RP aims to avoid unacceptable risk and to reduce exposures as low as reasonably achievable
- **Tolerability of risk**: not welcome but can be reasonably tolerated
- **Reasonableness**: development of a reasoning accessible to others and the promotion of a fair cooperation; acting in good faith
- Requires inclusion of stakeholders
Tolerability and Reasonableness

Level of individual exposure

Unacceptable risk

Tolerable risk

Limit

Optimisation

ALARA level

Acceptable residual risk

Courtesy T. Schneider
Procedural ethical values

- **Accountability**: the responsibility of answering for one's actions to those affected (positively or negatively)
- **Transparency**: openness about decisions and activities that affect society, the economy, and the environment, and willingness to communicate these in a clear, accurate, timely, honest, and complete manner
- Accountability and transparency allow citizens to be aware of up-to-date information required to make informed decisions
- **Stakeholder involvement**: involving all relevant parties in the decision-making processes related to radiation protection; inclusiveness
Ethical foundations of the system of radiological protection

Major ethical theories
- Utilitarian
- Deontological
- Virtue

Core ethical values
- Beneficence/non-maleficence
- Prudence
- Justice
- Dignity

Reasonableness
- Justification
- Optimization
- Limitation

Tolerability

System of RP
- Accountability/Transparency
- Stakeholder involvement

Procedural ethical values

<table>
<thead>
<tr>
<th>Core Values</th>
<th>Correlated values</th>
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<td>Respect for Autonomy</td>
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Principles of Biomedical Ethics, Beauchamp and Childress

Prudence
In practice, the search for

- **appropriate** exposure situations (**justification**)
- **reasonable** levels of protection (**optimization**)
- and **tolerable** exposure levels (**dose limitation**)

is a permanent questioning which depends on the prevailing circumstances with a desire to

- do more good than harm (**beneficence/ non-maleficence**)
- avoid unnecessary risk (**prudence**)
- seek fair distribution of exposures (**justice**) and
- treat people with respect (**dignity**)

**Overall ethical goal**
To promote individual well-being and the quality of the living together

**Ethical values of RP**
Beneficence/non-maleficence, prudence, justice, dignity, accountability, transparency, inclusiveness

**Practical wisdom**
Combining science, ethics and experience to act effectively, prudently and fairly
Justification of protection strategies goes far beyond the scope of radiological protection as they may also have various economic, political, environmental, social, and psychological consequences.

Optimization of protection is not minimization of dose. Optimization of protection is the result of an evaluation which carefully balances the detriment from the exposure with the relevant economic and social factors.

The value of the reference level should result from a careful balance of many inter-related factors, including the sustainability of social, economic, and environmental life, and the overall health of the affected populations… appropriately including stakeholder views.
There is a need to “balance” values and to embrace the messiness of ethics; there may be incommensurable values and moral ties and indeterminacy – but this does not lead to relativism – there are still lots of wrong answers, even if there isn’t a uniquely right one.

Accountability • Accuracy • Adaptability • Benevolence • Candor • Charity • Clarity • Compassion • Competence • Confidence • Consistency • Correctness • Credibility • Decisiveness • Dignity • Effectiveness • Efficiency • Empathy • Environmental protection • Fairness • Fidelity • Gratitude • Harmonization • Honesty • Human health • Individual autonomy • Individual benefit • Integrity • Justice • Knowledge • Leadership • Logic • Mercy • Meticulousness • Modesty • Non-maleficence • Open-mindedness • Partnership • Paternalism • Peace • Practicality • Pragmatism • Precaution • Promise-keeping • Promotion of aggregate good • Protection of animals • Protection of children • Protection of future generations • Privacy • Rationality • Reasonableness • Reparation • Responsibility • Human rights • Scientific correctness • Significance • Simplicity • Sincerity • Social benefit • Societal autonomy • Solidarity • Soundness • Stability • Timeliness • Tolerance • Trustworthiness • Truth • Understanding • Usefulness • Vision • Wisdom

Courtesy C. Clement
A witch is a female who burns. Witches burn – because they’re made of wood. Wood floats. What else floats on water? A duck; if something has the same weight as a duck it must float. A duck and scales are fetched. The girl and the duck balance perfectly. “Burn the witch!”

Monty Python and the Search for the Holy Grail
Moving forward

How can ethical theory be made more accessible?

Goal: engage interested parties in ethical decision making

How can ethical theories be applied in a practical way?

Goal: provide a framework for dealing with real problems

Currently Task Group 109: Ethics in Radiological Protection for Medical Diagnosis and Treatment

Inclusion of the ethical considerations in future ICRP publications