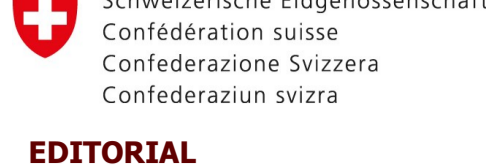


Network radiation accident Switzerland



EDITORIAL

Dear Readers,

In recent months, coverage of the war in Ukraine, which has been going on for over three years, has temporarily disappeared from the headlines. But while reporting on the war here in Switzerland has faded into the background, the reality on the ground remains unchanged: the conflict continues and has become a new normality, posing immense challenges for both the people of Ukraine and the international community.

Particularly worrying are the latest reports of regular drone attacks that deliberately target critical infrastructure. In February, one attack targeted the new confinement of the former Chernobyl reactor. The fires that were started destroyed parts of the containment, but fortunately no increased levels of radioactivity were detected. Such attacks illustrate the ongoing escalation and the complexity of the situation, which includes not only military but also humanitarian dimensions.

Despite these gloomy developments, there are also rays of hope: the current peace efforts are a step in the right direction and show that there is a will to de-escalate and to find solutions. However, the confusing situation and the continuing uncertainty make the nuclear threat seem ever-present. At a time when the international community should be standing together, it is crucial that we are aware of these dangers and work together to find a peaceful solution.

In this context, the preparations of the Federal Office of Public Health (FOPH) presented in this newsletter and the new treatment concept of Urs Schanz, which aims to increase the resilience of the



population, are certainly small but important steps. The collaboration between the University Hospital Zurich (USZ), the FOPH, the Swiss Federal Nuclear Safety Inspectorate (ENSI) and the Swiss National Accident Insurance Fund (Suva) to promote knowledge about radiation accidents remains of great importance. In this issue of our newsletter, Philipp Habegger thus presents the perspective and the tasks of the Suva in the event of radiation accidents. As usual, you will also find a presentation of recent literature and publications, as well as a preview of the topics of the upcoming network event.

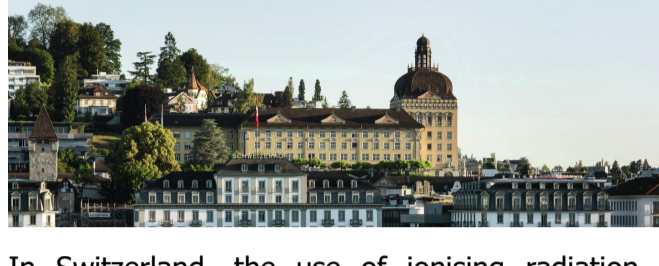
We invite you to exchange ideas with us on these topics and to work with us to find ways in which we as a society can respond to the challenges posed by the conflict in Ukraine and its global impact.

Stay informed and engaged.

Kind regards, Daniel Storch

CONTRACT PARTNER INTRODUCTION

Philipp Habegger, Suva



In Switzerland, the use of ionising radiation is clearly regulated in the Radiation Protection Ordinance. A company must obtain a permit from the relevant regulatory body before starting work involving ionising radiation. There are three such bodies: the FOPH for the health sector, ENSI for nuclear facilities, and Suva, which is the regulatory authority for industry, trade and private research institutes. The executive authorities monitor the conformity of the facilities and the safety of the people who work in the respective sector.

In the event of a radiation accident (sudden, unintentional and unforeseen exposure to ionising radiation), the absorbed dose over a certain period of time is particularly crucial. Radiation accidents are divided into two groups:

- external radiation
- Contamination/ingestion of radioactive particles

In the case of external irradiation, the effect of the radiation ceases as soon as the body leaves the radiation field. In the case of contamination and ingestion, caregivers must also be protected from radiation exposure.

If workers are affected (extremely rare, usually without after-effects), Suva must be informed about the measures taken (arbeitsmedizin@suva.ch). Suva will order any follow-up medical examinations that may be required and will review the continued suitability for occupational radiation exposure. In particular, a distinction is made between early and late damage. Late damage can take the form of cancer (stochastic late damage), for example. To assess the radiation dose to which the body was exposed in the event of an accident, 'biological dosimetry' is used, i.e. the concentration of lymphocytes is determined and, depending on the case, a chromosome analysis is also carried out. The concentration of radiation-sensitive lymphocytes in the blood drops by 500 mSv within 24 hrs of exposure (a rough measure of radiation dose). From a dose of 250 mSv,

useful results can be obtained in a complex chromosome analysis.

If exposure is likely to have occurred at between 50-250 mSv, medical check-ups (if possible within 24 hours) are recommended. If exposure has occurred at between 250-1000 mSv, a check-up at a regional hospital is necessary within 24 hours. Those affected are often symptom-free up to 1000 mSv, but analyses of the haematopoietic system and the organ systems are indicated. At over 1000 mSv, rapid admission to a university hospital or radiotherapy facility is necessary. Significant organ damage is only to be expected from 6000 mSv upwards. Complex treatments such as stem cell transplantation are often indicated. Consultation with the USZ (haematology/oncology) is currently recommended.

Previously (from 1963), a preventive occupational health examination by Suva existed for all occupationally exposed persons. Since there are hardly any occupational illnesses caused by ionising radiation in Switzerland and these were extremely rarely detected by the preventive medical check-ups at



Der Strahlenunfall Was ist zu tun?

the time, Suva discontinued these in 2016. Personal dosimetry has proven to be an excellent method for monitoring the health of people occupationally exposed to radiation.

For more information on this topic, please refer to the Suva brochure 'Der Strahlenunfall – Was ist zu tun?' (<https://www.suva.ch/de-ch/download/dokument/der-strahlenunfall/der-strahlenunfall-2869/21.D>) and the page <https://strahlenunfall.ch/>.

SWISS TREATMENT CONCEPT FOR RADIATION-INJURED PERSONS

A draft for comment was sent to Swiss centres and institutions on February 13 2025.

Begun in early March 2024, the Swiss Concept for the Treatment of Radiation-Injured Persons was sent out on February 13 2025. A German and English draft version was made available electronically as a Word document to all potential Swiss treatment centres and institutions, as well as to all network participants, for comments by April 30 2025. It is also publicly available as a PDF on our homepage Strahlenunfall - strahlenunfall.ch

We hope to receive as many comments and suggestions for improvement as possible.

Why a special Swiss treatment concept?

There are already a number of excellent treatment concepts and guidelines, most of them American. Recently, a German and a French concept were



also published, both of excellent quality:

- [Die Strahlenschutzkommission - Publikationen - Strahlennotfallmedizin Handbuch für die medizinische Versorgung und Ausbildung](#)
- [Guide national d'intervention médicale en situation d'urgence nucléaire ou radiologique - 28/02/2024 - ASN](#)

This raises the legitimate question of whether a separate Swiss treatment concept is still necessary at all.

Nevertheless, the following arguments prompted us to write the Swiss concept:

The existing concepts are without reference to Swiss events and in addition

- often older (10 or more years),
- very (too) extensive, which makes it difficult to find your way around,
- not always freely accessible on the internet or difficult to find

For these reasons, we have written a new Swiss treatment concept in the course of 2024, which of course is strongly based on the above-mentioned, already existing guidelines and documents.

We have based our concept on the following objectives:

- The document should primarily be readable and freely available online.
- The chapter 'Treatment' forms the core of the document.
- All chapters can be read independently of each other, but are also linked to each other.
- The document should be suitable for use as a training document and also for targeted use in the event of an actual incident.
- Swiss circumstances are taken into account.
- The total length of the document should not exceed 100 pages.

The complete document can be found as a PDF on our website at '[Behandlungskonzept](#)' in both German and English at '[Treatment concept](#)', as PDF on our homepage Strahlenunfall - strahlenunfall.ch. French and Italian versions are planned for the second half of the year.

Please let us know your opinion of the treatment concept (urs.schanz@usz.ch). Comments such as whether the treatment concept meets the requirements, the content is easy to understand, the proposed treatments seem feasible or whether there is missing content are very helpful to us. If you find any errors and would like to send us corrections, you can also request a Word version (urs.schanz@usz.ch).

If you are interested and think that a presentation of the concept in your clinic or institution would be helpful, please do not hesitate to contact us directly (urs.schanz@usz.ch). We are also happy to answer any questions you may have.

Outlook:

We have also visited all major haematological oncology clinics and centres, as well as other interested parties in Switzerland, in the last two years. We have now contacted them again and asked for their input and any corrections to the document by 30 April 2025. We will then use the suggestions received to create a final version over the following months.

We have offered the same institutions an additional on-site presentation and hope that this offer will be taken up frequently. This lecture also qualifies for credit towards the mandatory radiation protection training (see [SR 814.501.261 - EDI Ordinance of 26 April 2017 on the Radiological Protection of the Population \(RPO\) | Fedlex](#))

PREPARING FOR A POSSIBLE NUCLEAR INCIDENT IN UKRAINE



The FOPH has been preparing for a possible nuclear incident in Ukraine since 2022. A separate task force was set up in the Radiological Protection Division with the aim of completing the work by the end of 2024 and to be able to separate it more effectively from the regular work. The task force met every two weeks to discuss the current situation and the status of the work, to hold technical discussions and to make decisions. This significantly increased the efficiency of the collaboration.

The working group on decontamination and waste in the event of a nuclear accident, which has been in place since the end of 2023 and consists of members from the Swiss federal authorities and cantons, has been working intensively on a background document on health protection measures.

In addition to options for decontamination, solutions have also been developed for the disposal of waste arising in all areas of the response (health protection, food and agriculture). The working group on food and agriculture was able to complete its background document on food and agriculture in the event possible nuclear incident by summer 2024. Work also continued on the concept for the inspection of vehicles and goods upon their import or transit and of persons entering Switzerland in the event of a nuclear incident in Ukraine and on the communication products. In addition, an implementation aid with process graphics was developed to provide a better overview.

In November, a final informal round of consultations with federal offices, cantons and other interest groups was carried out with the revised documents, in particular with the updated Emergency Ordinance Ukraine (i.e. the 'drawer ordinance' for the event of a nuclear incident in Ukraine). The various feedbacks were incorporated into the finalisation work, so that the Ukraine document could be completed by March 2025. The various working groups will remain in place and will now focus on planning and preparing further scenarios such as the nuclear power plant accident in Switzerland.

PRESENTATION OF NEW LITERATURE AND PUBLICATIONS

BAG-Bulletin 36/2024

On 2 September 2024, the new list 'Antidotes for Poisoning 2024/2025' was published in BAG-Bulletin 36/24.



It is reviewed and updated every two years by a group of experts consisting of members of Tox Info Suisse, the Swiss Association of Official and Hospital Pharmacists and the Military Pharmacy.

It also includes a range for radionuclides.

Radionuclides can be released during radiation accidents and nuclear incidents and enter the body through the respiratory organs or the gastrointestinal tract, depositing in specific organs (incorporation) and either damaging them directly or leading to the development of cancer in the longer term. The use of appropriate antidotes at an early stage should prevent or at least limit any damage. These antidotes are either specific, such as potassium iodide tablets against I-131 (radioiodine), or directed against element groups, such as Ca-DTPA against the transuranics. For a correct application, the incorporated radionuclide must be known.

2d. Sortiment für Radionuklide

Die ZüriPharm AG verwaltet ein beschränktes Zusatzsortiment von Antidot für Radionuklide und wird beraten von PD Dr. med. U. Schanz.

Die mit * gekennzeichneten Substanzen werden von der ZüriPharm AG in kleiner Menge an Lager gehalten. Die übrigen Substanzen gehören zu diesem Sortiment, werden aber nicht speziell an Lager genommen, weil sie entweder für andere Indikationen weit verbreitet oder Bestandteil des Sortiments für Regionalzentren sind. Zudem wurden in den Gemeinden im Umkreis von 50 km um ein schweizerisches Kernkraftwerk

Kaliumiodid-Tabletten vorsorglich an alle Personen verteilt, die sich regelmässig dort aufhalten. In diesen Gemeinden liegen Jodtabletten ebenfalls in Apotheken und Drogerien und könnten dort bei Verlust bezogen werden.

In den Gebieten ausserhalb von 50 km um ein schweizerisches Kernkraftwerk lagern die Kantone Kaliumiodid-Tabletten.

Für Fragen steht die Klinik für Nuklearmedizin, Universitäts-spital Zürich, zur Verfügung (Strahlenschutz.Nuklearmedizin@usz.ch, Tel. direkt 043 253 76 50, über USZ-Zentrale 044 255 11 11).

Radionuklid	Antidot-Wirkstoff	Produktbezeichnung	Dosierung	Bemerkungen
Caesium-137 und Caesium-134	Eisen(III)-hexacyano-ferrat(III) (Berlinerblau) (Bezugsquelle s. Anhang)	*Radiogardase®-Cs 500mg Hartkaps (IMP D)	Erw./Schwangere: Nur bei Ingestion initial 1 x 3g anschliessend wie bei Inhalation 3 x 1 g pro Tag während mind. 30 Tagen Kinder/Jugendliche 2 – 18 Jahre: 3 x 1 g pro Tag	Kinder <2 Jahre: keine Dosiseempfehlungen vorhanden

Literature-Review-on-Health-Impacts-of-Ionising-Radiation.pdf

This monographic literature review on the health effects of ionising radiation was commissioned by the Ministry for Veterans of New Zealand and was published in 2023.



It also includes more recent literature up to 2022.

The publication, together with the appendices, is over 160 pages long and is almost the length of a book.

The individual sections discuss the evidence for the harmful effects of ionising radiation on:

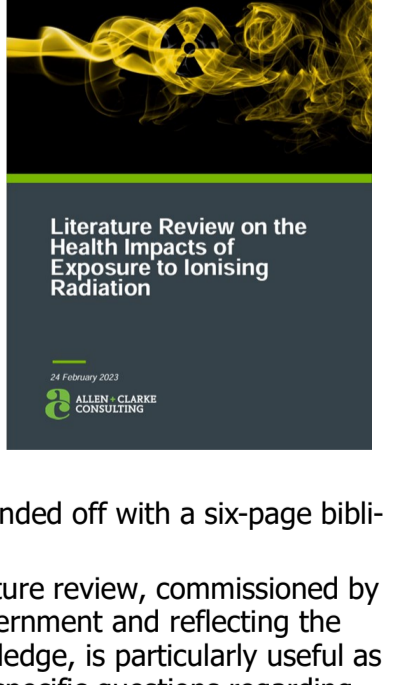
- non-solid or solid tumours,
- organ-specific tumours,
- but also non-malignant effects and
- genetic changes.

Brief comments are also made on individual events such as Hiroshima and Nagasaki and others.

In the appendices A – D, reviews, cohort studies, case-control studies and qualitative studies are examined for quality and validity using CASP (Critical Appraisal Skills Programme) checklists ([CASP Checklists - Critical Appraisal Skills Programme](#)).

The publication is directed off with a six-page bibliography.

This interesting literature review, commissioned by the New Zealand government and reflecting the current state of knowledge, is particularly useful as a reference work for specific questions regarding the effects of ionising radiation on humans.



PREVIEW OF RADIATION ACCIDENT NETWORK EVENT, 20.06.25

We warmly invite you to our eighth **network event on radiation accidents**, which we will be holding as usual in Bern in hybrid form on 20 June 2025.

The main focus of this event will be on presenting the Swiss treatment concept.

Furthermore, we will also give an important partner

in our network a chance to speak and gain insight into the reorientation of the Coordinated Medical Services (CMS).

Of course, we will also include contributions from the network in the programme. Contact us via: nina.mosimann@bag.admin.ch

We look forward to welcoming you on site or virtually and to an exciting event with interesting discussions and contributions!

SAVE THE DATE!

8th Network event on radiation accidents: **20 June 2025** in Bern

CONTACT

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Schwarzenburgstrasse 157
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[Strahlenunfall – USZ Strahlung, Radioaktivität & Schall \(admin.ch\)](#)