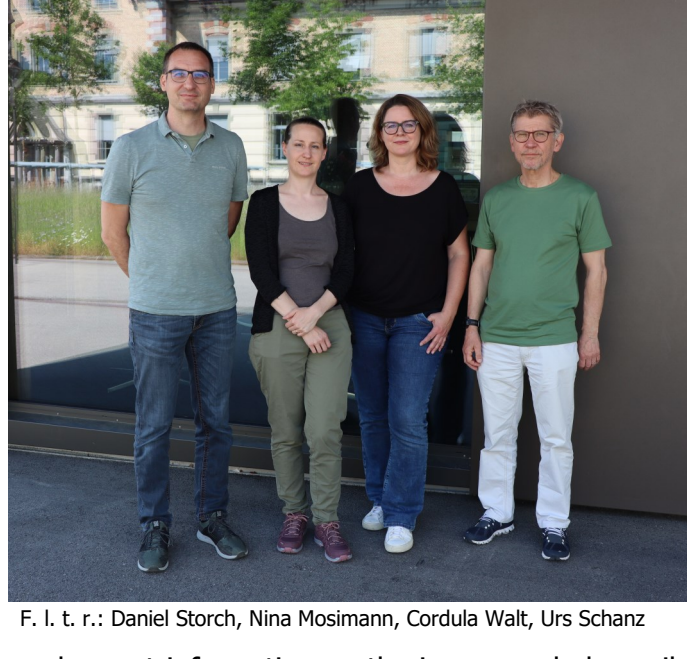


EDITORIAL

The current war in Ukraine has significantly changed the situation in Europe and also in Switzerland. In addition to the hostilities themselves, there is also the latent fear of a nuclear incident, be it in the form of an accident at a nuclear facility or perhaps even a targeted attack on a nuclear power station. Even the deployment of tactical nuclear weapons is suddenly conceivable again. So how do we deal with all this, in Europe and in Switzerland? And are we adequately prepared for such a threat?

The Swiss Federal Council mandated the Federal Office of Public Health (FOPH) back in 2018 to ensure that knowledge levels were maintained in Switzerland on how to treat and deal with persons severely exposed to radiation. Since they are generally very rare, such incidents are not a direct concern in our day-to-day lives. 2019 also saw a survey of hospitals conducted by the FOPH which painted a sobering picture of how well persons severely exposed to radiation might be treated in Switzerland: few medical centres had any emergency plan or treatment concept in place for such an eventuality. Yet, as the last few months have confirmed, there is a clear awareness of such possibilities, and an equally clear interest in acquiring the requisite information.

The Swiss supervisory authorities on protection from radiation – the FOPH, the Federal Nuclear Safety Inspectorate ENSI and the Swiss National Accident Insurance Fund (Suva) – have begun, in collaboration with University Hospital Zurich (USZ), to get the relevant partners around the table and address the issue of treating irradiated persons. Working with a small but select team from USZ, we're striving to collate and disseminate all the relevant information. This may brought a fifth network event among the partners; and in addition to these, we now also want to make important, useful



F. I. L. r.: Daniel Storch, Nina Mosimann, Cordula Walt, Urs Schanz

and recent information on the issue regularly available via a newsletter publication.

This first issue of our new newsletter presents the first in a series of articles in which we'll introduce you to the key individuals in our network, beginning with Urs Schanz. You'll also find further details of the above-mentioned collaboration between the FOPH, ENSI, Suva and USZ; an item on the coming distribution of iodine tablets this autumn and how these work; and an article on the meeting of the Nuclear Accident Committee (NAC) at the EBMT Annual Meeting in Paris this April.

I hope you enjoy our first newsletter, and look forward to your feedback.

Daniel Storch

INTRODUCING URS SCHANZ, PD Dr.med.



I'm a specialist in internal medicine and haematology, and I served at University Hospital Zurich (USZ) for more than 35 years – the last 23 of them as Head of Stem and Immune Cell Therapy in the Clinic for Medical Oncology and Haematology. Since 2019 I've also been working 20% for the Federal Office of Public

Health (FOPH). My primary mission here is to help perform the legal mandate which is formulated in Article 135, Section 5 of Switzerland's Federal Radiological Protection Ordinance as follows: "The FOPH shall ensure the maintenance of knowledge on the treatment of severely exposed persons".

This core task is the main focus of my FOPH work, though many other activities are related to it, too. The precise details of these are regulated by a contractual agreement between the FOPH and USZ (which is further supported by ENSI and Suva).

The agreement is valid for a four-year period, and was renewed (for the first time) this year. As a result, I can continue to perform these highly interesting duties following my retirement in November 2022 for the next four years, until 2026. And I can now newly do so with the invaluable support of our quality manager Cordula Walt.

In my non-working time I take regular care of our granddaughter together with my wife, and we also try to spend more time visiting our three other grandchildren who live further away. I'm a passionate cook, too, and love cooking for guests. In summer you'll often find us in the Prättigau in Graubünden. And last but not least I'm trying to devote a little more time to reading: I've now set myself the goal of reading at least one book by every winner of the Nobel Prize for Literature. That will be 120 people by December of this year! But at least I'm familiar with a few of them already.

I'm looking forward to giving you regular medical information and updates on the whole issue of treating patients who have been exposed to radiation via our new newsletter.

EXTENSION OF THE CONTRACT WITH THE UNIVERSITY HOSPITAL ZÜRICH

In accordance with Article 135 of the Swiss Federal Radiological Protection Ordinance, the FOPH is responsible for maintaining knowledge levels on the treatment of severely exposed persons. In this regard, the FOPH is also one of the collaborating centres in the WHO's Radiation Emergency Medical Preparedness and Assistance Network or REMPAN ([REMPAN Radiation Emergency Medical Preparedness and Assistance Network \(who.int\)](#)).

A contractual collaboration was concluded in 2019 between Switzerland's supervisory authorities on protection from radiation – the FOPH, the Federal Nuclear Safety Inspectorate ENSI and the Swiss National Accident Insurance Fund (Suva) – and the Competence Centre for the Treatment of Radiation Incident Victims at University Hospital Zurich (USZ) to ensure that such knowledge is maintained in Switzerland at the levels required. The initial agreement expired at the end of 2022, but has been successfully renewed for a further four-year period, from 2023 to 2026.

In this second contractual period, the partners will

be seeking to continue their work to date on the USZ's webpage [Strahlenunfall – USZ](#), the Swiss radiation accident network and the collaboration with international partners. But a particular focus should be placed, too, on devising and developing a concrete treatment concept, along with the associated training and education foundations. Further expanding and consolidating the network and providing useful information via a new newsletter will be further key concerns.



VISIT OF THE NUCLEAR ACCIDENT COMMITTEE (NAC) AT THE EBMT ANNUAL MEETING IN PARIS, 23.–26. APRIL 2023

The Nuclear Accident Committee (NAC) was created by the board of the EBMT (the European Society for Blood and Marrow Transplantation) in 2002, in the light of the 9/11 event the previous year.

The original aim of the NAC was to ensure adequate preparation against a terrorist attack using radioactive materials. This could be in the form of 'dirty bombs' – conventional explosives combined with radioactive material, which could irradiate wide areas around the detonation point – or in the form of radiation exposure devices or REDs, which could covertly expose individuals or groups to radioactive material, generally over a longer period.

The NAC continues to be chaired by the now 85-year-old Professor Ray Powles of the UK. The Committee generally meets in the course of the Annual Meeting of the EBMT. I have been a member of the NAC, serving as Switzerland's representative, for more than 15 years.

The activities of the NAC had been relatively low-key in recent years since the Fukushima nuclear power plant accident of 2011, with even its annual meetings no longer held. But interest in the field was dramatically revived in autumn 2022 through President Putin's threats to deploy nuclear weapons in the Ukraine war. As a result, while its previous annual gatherings had seen fewer than ten participants, this year's NAC meeting on 24 April attracted at least 25 attendees!

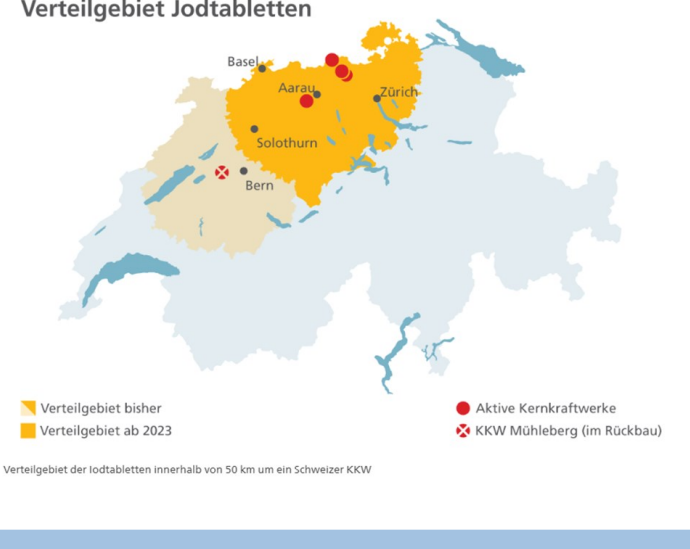
The 2023 NAC meeting was in two parts:

1. The **Ukraine Radiation Resilience / Response Programme**, in which three haematologists from Ukraine reported on their present work on the ground. Their travel to Paris for the event had been tiring and dangerous in itself. Ukraine's hospitals are in differing degrees of poor condition, the trio reported, but were still striving to offer a full range of medical care. They also tellingly recounted the death of the only paediatric haematologist in one particular region: she had been killed on the street in a missile attack, as she was going to collect her child from school.
2. The **EBMT NAC Training Programme**, which had also been offered previously at irregular intervals. In the past, the programme had largely consisted of one person talking for an hour or so on what the medical response could be to a radiation incident or a nuclear disaster. This year, no fewer than five knowledgeable presenters were secured: Ray Powles (UK), Michel Drouet (France), Matthias Port (Germany), Marc Benderitter (France) and Leif Stenke (Sweden). The two-hour session was correspondingly valuable.

In conclusion, the 2023 NAC Meeting was well worth attending. Our knowledge levels in Switzerland are well up to date (see also our webpage [Strahlenunfall – USZ](#) and [Nuclear Accident Committee | EBMT](#)). The gathering also offered further opportunities to make new contacts with knowledgeable and experienced individuals in this vital specialist field.

PRECAUTIONARY DISTRIBUTION OF IODINE TABLETS IN AUTUMN 2023

Taking iodine tablets promptly in the wake of a nuclear power station accident is an effective way to prevent thyroid cancer for children, adolescents, mothers-to-be and others under 45. To ensure that they can be taken as quickly as possible in such an event, iodine tablets are distributed in advance to all Swiss households and institutions (including schools, kindergartens and nurseries) within 50 kilometres of any Swiss nuclear power plant. In regi-



ons outside such areas, the cantons maintain sufficient stocks of iodine tablets to supply the local population if needed. In such an event, the cantons would be able to provide their inhabitants with the tablets required within 12 hours.

The tablets concerned are an approved medication. They can be kept for up to ten years, after which they must be replaced.

Following the removal of the Mühleberg nuclear power station from the Swiss energy grid in 2019, numerous municipalities in Cantons Bern, Solothurn, Fribourg, Neuchâtel and Vaud no longer lie within a 50-kilometre radius of a nuclear power plant. As a result, these communities will no longer receive their precautionary iodine tablets. The cantons concerned will maintain their own stocks of such tablets instead, to be issued promptly if necessary to the inhabitants concerned.

The last distribution of iodine tablets to populations within a 50-kilometre radius of a nuclear power plant was in 2014. The Swiss Military Pharmacy will conduct a **new distribution drive this autumn** to all homes and institutions within 50 kilometres of the Gösgen, Beznau and Leibstadt plants. The drive will extend to 778 municipalities and some four million persons.

EFFECTS AND SIDE-EFFECTS OF THE PRECAUTIONARY CONSUMPTION OF IODINE TABLETS

See also: [Jodtabletten \(admin.ch\)](#)

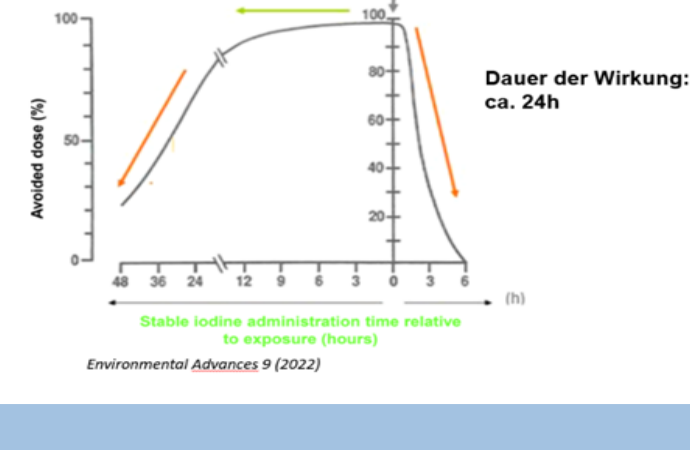
In the event of an accident at a nuclear power station, radioactive iodine-131 may be released into the atmosphere, and may then enter the human body through the airways or (via food) through the gastrointestinal tract. Iodine tablets, which contain potassium iodide and the stable iodine, are designed to prevent or at least minimise any iodine-131 (which contains β and γ radiation and has a half-life of eight days) accumulating in the thyroid gland. The recommended adult preventive dose of 130 mg of potassium iodide (= 100 mg of iodine, or two tablets) is more than 500 times the daily iodine dose of 150-200 μ g recommended by the WHO and five to ten times the body's usual total iodine content of 10 to 20 mg.

This pharmacological dose of stable iodine will

1. dilute any iodine-131 ingested and circulating in the blood. This in turn will reduce the likelihood of the iodine-131 being actively assimilated into the thyroid gland cell or follicle (via the sodium/iodide symporter, NIS, a transport protein), simply because the concentration of the iodine-131 has been so substantially reduced.
2. ensure, by providing a high concentration of stable iodine within the thyroid gland, that the gland becomes saturated, and also that the NIS begins to downregulate. This stops iodine-131 being absorbed into the thyroid gland. The excess iodine, including any iodine-131, will be excreted from the body via the faeces and urine with a biological half-life of just a few hours. This process is known as 'iodine blocking'.

If iodine-131 has already settled in the thyroid gland, it can no longer be removed, even with the highest doses of stable iodine.

Important: The timing of the taking of iodine tablets is crucial. The best time to take them is up to six hours before expected exposure. Even as little as two hours after exposure, their efficacy is reduced to 80%, and after six hours is virtually nil.



Once (promptly) taken, the tablets will remain effective for some 24 hours.

Studies of the local population following the Chernobyl nuclear disaster showed that the benefits of taking iodine tablets – i.e. the reduction in the likelihood of developing thyroid cancer – depend on the age of the individual, the volume of radioactive iodine accumulated and the general iodine supply situation among the population as a whole.

The likelihood of developing thyroid cancer following exposure to radioactive iodine declines with age. With doses of up to 2 Gy, in children aged up to 14 the relative risk of developing thyroid cancer will increase by a factor of 5.5 to 8.4 for every Gy of radiation to which the thyroid gland is exposed. In higher age groups of 30 years or more, however, no statistically significant increase in the risk of thyroid cancer could be seen (KSR 20.09.2022, Version 2, 02.12.2022).

The high volumes of iodine which the body ingests when taking iodine tablets if needed can cause some undesired side-effects, and in particular lead to an over-functioning of the thyroid gland. The risk of this rises with gender (women are more susceptible) and with age. In view of both the tablets' diminishing benefit with age and the increased risk through age of suffering unwanted side-effects, the Swiss Federal Commission for Protection from Radiation (KSR) now no longer recommends the taking of iodine tablets for persons over 45. This age limit was intentionally chosen to ensure that the taking of such tablets continues to be recommended for women still at childbearing age. Since the thyroid gland develops relatively early in the embryo's development, the protection of the unborn child's thyroid should still be assured even if the mother is unaware that she is pregnant at the time such taking is advised.

Further information:

KSR recommendation: [KSR-Empfehlung vom 20. September 2022](#), Version 2, 02.12.2022.

[\(PDF\) Cancer consequences of the Chernobyl accident: 20 Years on \(researchgate.net\)](#)

[2016 American Thyroid Association Guidelines for Diagnosis and Treatment of Hyperthyroidism and Other Causes of Thyrotoxicosis - PubMed \(nih.gov\)](#)

[Iodine kinetics and effectiveness of stable iodine prophylaxis after intake of radioactive iodine: a review - PubMed \(nih.gov\)](#)

USZ WEBPAGE RADIATION ACCIDENT

As has been communicated more than once at our joint network events with the FOPH on the Liebfeld campus, we have now established a dedicated [Strahlenunfall – USZ](#) webpage on the whole issue of radiation accidents on our University Hospital Zurich website. One of the main focuses of the webpage is the [REMM - Radiation Emergency Medical Management \(hhs.gov\)](#) platform of the US Department of Health & Human Services. The platform's 'Patient Management' section contains numerous suggestions and algorithms for treating

exposed persons. And thanks to the platform's intuitive design, any information desired is just a few simple clicks away.

Our webpage also offers several further links, a collection of previous radiation incidents, a 'Latest news' section and the presentations and documentation from all our previous network events.

Check out [Strahlenunfall – USZ](#) for yourself. And if you have any feedback, we'd be pleased to receive it!



COMING EVENT

Save The Date **Network event 6: 25.10.23**

With a particular focus on 'The state of affairs in Germany on treating and preparing for emergency irradiations' and the WHO's new publication on recommended stockpiles

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