

When penicillin came to Norway

MEDICAL HISTORY

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Background

Penicillin was introduced during World War II. We sought to examine how penicillin was introduced in Norway and the challenges of distribution faced by the government and health service during the German occupation.

Material and method

We conducted searches in the following collections at the National Archives of Norway: Norwegian Medical Association, Pharmacy Office, Norwegian Directorate of Health in London, Office of the Chief Medical Officer in Washington and the Norwegian Relief Central in Sweden. We also obtained archival material from the Bjørn West Museum and searched the digital collections of the National Library of Norway.

Results

Penicillin was likely first used in Norway in the summer or autumn of 1944. The patient in question sustained osteomyelitis from a landmine injury, but the date, location and outcome of treatment are unknown. After this, penicillin was used sporadically, initially confined to liberated areas of Northern Norway. Norwegian authorities repeatedly requested penicillin from British and American counterparts, reporting a major demand among the population, but the Allies imposed strict conditions. In January 1945, a Norwegian Penicillin Council was established to oversee distribution according to American guidelines. Supplies had to pass through Sweden, where Swedish authorities assumed responsibility for both distribution and use in Norway. It was not until December 1946 that Norway received sufficient supplies of penicillin to meet national demand.

Interpretation

Penicillin was in short supply during the war, as British and American forces prioritised their own military needs. Consequently, Norway and other countries not directly participating in combat had limited access to penicillin.

Main findings

Penicillin was first used in Norway in a patient with osteomyelitis in the summer or autumn of 1944.

During World War II, the Norwegian government-in-exile experienced major difficulties in obtaining penicillin because of limited supplies and military priorities.

In January 1945, a Norwegian Penicillin Council was established to regulate distribution of the medication, and the first standard quota arrived in March 1945.

After Norway was liberated in 1945, penicillin gradually became more widely available, and by December 1946 all preparations could be obtained on prescription.

Alexander Fleming's (1881–1955) discovery of penicillin in 1928, and its subsequent testing and mass production by Howard Florey (1898–1968) and Ernst Chain (1906–79) in collaboration with the United States' pharmaceutical industry, represent some of the most important milestones in medical history [\(1, 2\)](#). As the first effective natural antibiotic, penicillin revolutionised the

treatment of bacterial infections and saved countless lives. The current rise in antibiotic resistance means that common infections can once again become fatal, and history is a reminder of our vulnerability in the absence of effective antibiotics.

Penicillin was first used during World War II (Figure 1) (3). Although much has been written about its discovery, development and production, less attention has been paid to when and how it was actually introduced into clinical practice.

**Every minute Lost
on this job may mean..**

**The Faster this building
is completed, the quicker
our wounded men get**

Penicillin
THE NEW LIFE-SAVING DRUG

*Give this job **EVERYTHING** You've got!*

Figure 1 'The faster this building is completed, the quicker our wounded men get penicillin'. The United States began mass producing penicillin in 1944. Photo: Science

The very first patient known to have received penicillin was the English policeman Albert Alexander, who was treated on 12 February 1941. He died a few weeks later because there was insufficient penicillin available to complete the course of treatment [\(4\)](#). Penicillin was used successfully a year later in the United States, in March 1942 [\(5\)](#), while the first patient in Australia was treated in 1943 [\(6\)](#).

There are various, often anecdotal, accounts of when penicillin was first used in Norway [\(4, 7, 8\)](#). However, evidence is limited and few studies have been conducted based on the available archival material. How was penicillin introduced in Norway, and what challenges did the government and Norwegian health service face in introducing and distributing the medication in an occupied country?

Material and method

This article is based on material from the following archives held at the National Archives of Norway: Norwegian Medical Association, Pharmacy Office, Norwegian Directorate of Health in London, Office of the Chief Medical Officer in Washington and the Norwegian Relief Central in Sweden. We also obtained material in a review of notes and correspondence between the Norwegian government-in-exile in London, Stockholm and Washington, as well as the Allied authorities, supplemented by searches for 'penicillin' in arkivportalen.no. Documents were also provided by the Bjørn West Museum.

Among printed primary sources, we examined literature written close to the time of the war, identified through searches in the National Library of Norway's digital collection.

A hermeneutic approach was employed in the historical analysis.

War and German occupation

Penicillin proved extremely difficult to mass-produce, a challenge that persisted until after the outbreak of World War II. At that point, the Americans recognised that penicillin would be critical for the war effort and committed substantial financial resources to its production [\(2, 9\)](#). Initially, penicillin was used almost exclusively to treat soldiers. The Norwegian authorities in Washington reported in January 1944 that 'Most of the penicillin currently being produced is allocated to the Army, Navy and Air Force. Limited quantities are, however, being provided to civilian institutions [...] in the United States' [\(10\)](#). Penicillin saved the lives of a large number of soldiers and helped the Allied war effort, making it an important instrument of war.

The population of Norway gradually became aware of penicillin and the remarkable results achieved by the Allies [\(11, p. 5\)](#). The Norwegian government-in-exile in London established legations in Stockholm and

Washington, collectively known as 'Outside Norway' (*ute-Norge*). Through extensive collaboration with the resistance movement in Norway, a close relationship developed between occupied Norway and the external legations ([12, p. 52](#)). This structure was crucial to the approach used to secure penicillin for Norway.

First use of penicillin in Norway

Several accounts exist of when penicillin was first used in Norway. Johannes Kvittingen (1906–96), a naval doctor in Scotland during the war, travelled to the United States in 1943 where he met a Norwegian seaman who had been successfully treated for gonorrhoea. Returning to Scotland that autumn, Kvittingen requested a delivery of penicillin, and from May 1944 he received 500,000 Oxford Units (OU; 1 OU = 1 IU) per month for the treatment of gonorrhoea ([4](#)). In total, Kvittingen treated 122 Norwegians with penicillin in Scotland ([13](#)). In the spring of 1945, he arrived in Tromsø with 200 vials of penicillin, although it is uncertain when he began treating patients there.

Another account concerns Ingvald Juhlsen (1906–93), a cook who was associated with Bjørn West, a Milorg (the main Norwegian resistance movement) base in the mountains north of Bergen ([7, 14](#)). Dr Eilert Eilertsen (1918–2014) brought a small quantity of penicillin with him when he travelled to Norway from Shetland around New Year 1945, as part of a military operation in which he was involved ([14, pp. 62–63](#)). He subsequently received additional doses in an airdrop on 25 March 1945. Juhlsen, who had a finger infection and lymphangitis, was operated on by Eilertsen (personal communication, Arnold Matre, Bjørn West Museum, January 2024, based on a letter dated 18 July 1979 from Eilert Eilertsen to Arne-M. Hæggernes). According to a book published in 1946, 'He received penicillin the next day. This is the first time it has been used here in Norway, and the effect was excellent' ([7](#)).

A third story concerns Hjørdis Evensen (born 1914), who was admitted to Krohgstøtten Hospital in Oslo on 17 April 1945 with 'a high fever, streptococcal infection and blood poisoning' ([8](#)). The senior consultant obtained a few trial doses of penicillin, and the night after the first injection Evensen's fever was dramatically reduced. After eleven days of treatment, Evensen had fully recovered ([8](#)).

A search of the National Archives of Norway indicates that penicillin had been used even earlier. A letter dated 15 September 1944 ([15](#)) from the Norwegian Relief Central in Sweden to Karl Evang (1902–81) ([16](#)), Chief Medical Officer in London (Figures 2 and 3), states the following:

DEN NORSKE RELIEF-CENTRAL
I SVERIGE
HJU/GB

Alf. Nørze
Stockholm, 15. september 1944.

Medisinaldirektoratet
Jnr. 4965/44
Innkommnet 22/9
Arkiv 11.20

Herr medisinaldirektör Karl Evang,
p.t. L o n d o n.

Gjennom de herværende engelske og amerikanske legasjoner har svenskene nu fått stillet til disposisjon penicillin til behandling av 100 pasienter. De håper også etter hvert å få mere fra Amerika.

Vi mottar av og til forespørsler hjemmefra om muligheten for å skaffe penicillin til bestemte tilfeller. Således fikk vi nylig en slik anmodning om penicillin til en mann som hadde multiple osteomyeliter etter beskadigelse ved en landmine. Vi fikk da overlatt en porsjon av den svenske medisinalstyrelse. Det er nu gjennom de svenske aviser blitt kjent at der i Sverige er muligheter for penicillinbehandling. Dette vil sikkerlig også bli kjent i Norge, og vi vil da antagelig få flere anmodninger om å forsøke å skaffe stoffet. Jeg tillater meg derfor påny å forespørre om mulighetene for anskaffelse av en begrenset mengde som kunne sendes hjem til våre medisinske tillitsmenn. Hvis de allierte ikke vil gå med på dette, kunne vi kanskje få overlatt en mindre mengde til lagring her i Sverige, og så gjennom de svenske myndigheter sende stoffet over i de spesielle tilfellene.

Hans Jacob Ustvedt

Hans Jacob Ustvedt

Figure 2 Earliest documented penicillin treatment in Norway (15). Letter dated 15 September 1944 to Karl Evang, Chief Medical Officer at the Norwegian Directorate of Health in London, from Hans Jacob Ustvedt of the Norwegian Relief Central in Sweden. Photo: private, with permission from the National Archives of Norway, Norwegian Directorate of Health in London



Figure 3 Karl Evang, Chief Medical Officer at the Norwegian Directorate of Health in London, 1943 (16). As health director in the Norwegian government-in-exile, he was one of the key figures in efforts to secure penicillin for occupied Norway. Photo: National Archives of Norway/CC-BY 4.0

'We occasionally receive requests from home regarding the possibility of obtaining penicillin for specific cases. Recently, for example, we received such a request for a man suffering from multiple osteomyelitides after being injured by a landmine. We were then allocated a portion by the National Swedish Board of Health.'

The Norwegian Relief Central in Sweden was a humanitarian organisation established in 1940 to assist Norwegian refugees in Sweden and those in need in Norway. No information is available regarding the patient's name, the location within Norway, or the outcome of the treatment (15). This is the earliest known use of penicillin in Norway – in the summer or autumn of 1944.

Delayed supplies and help from the Swedes

The supply of penicillin in 1944 for the patient who sustained osteomyelitis from a landmine injury appears to have been a one-off event, as other requests for penicillin were declined [\(17\)](#).

During the war, the Norwegian government-in-exile submitted numerous requests to the United Kingdom and the United States for penicillin to treat patients in Norway, but until 1945 these efforts were largely fruitless. Both the British and Americans appeared to need everything they produced for their own military personnel [\(18\)](#).

After repeated negotiations, it was finally decided in November 1944 that Norway would receive a certain quantity of penicillin. The US authorities stipulated that Swedish authorities should take responsibility for its distribution and use in Norway. Alternatively, they were willing for the allocation to be added to the Swedish quota, with Norway footing the bill [\(19\)](#). The requirement for Swedish control would be expected to cease upon Norway's liberation [\(20\)](#).

Swedish authorities agreed to help out, and the Penicillin Council in Stockholm assumed responsibility for distributing penicillin in Norway, in the same way as they were already doing in Sweden [\(21\)](#). The penicillin destined for Norway was designated as 'Swedish property' [\(22\)](#). A total of 250–300 ampoules were allocated for Norway, with the monthly quota to be determined later. The ampoules were shipped on a Swedish Red Cross vessel from Philadelphia on Christmas Day 1944 [\(23\)](#).

There was a good reason why the penicillin was delivered via Sweden: since most of Norway was still occupied, the Allies needed to ensure that the 'miracle drug' did not fall into enemy hands. Norway had received medical supplies via Sweden during the war, thereby avoiding confiscation by the Germans [\(24\)](#). This strategy also proved effective for the delivery of penicillin.

However, the penicillin was slow to arrive. In February 1945, Hans Jacob Ustvedt (1903–82) at the Office of the Chief Medical Officer in Stockholm (Figure 4) [\(25\)](#) wrote that he had expressed to the Americans '[...] our great disappointment that no penicillin earmarked for Norway has yet arrived here.' The Americans, however, considered the delay 'a question of priorities' [\(26\)](#). Norway was a low priority. Particularly towards the end of the war, it was difficult to get the British and Americans to take an interest in Norway, as their focus was primarily on events elsewhere in Europe [\(12, pp. 54–55\)](#).

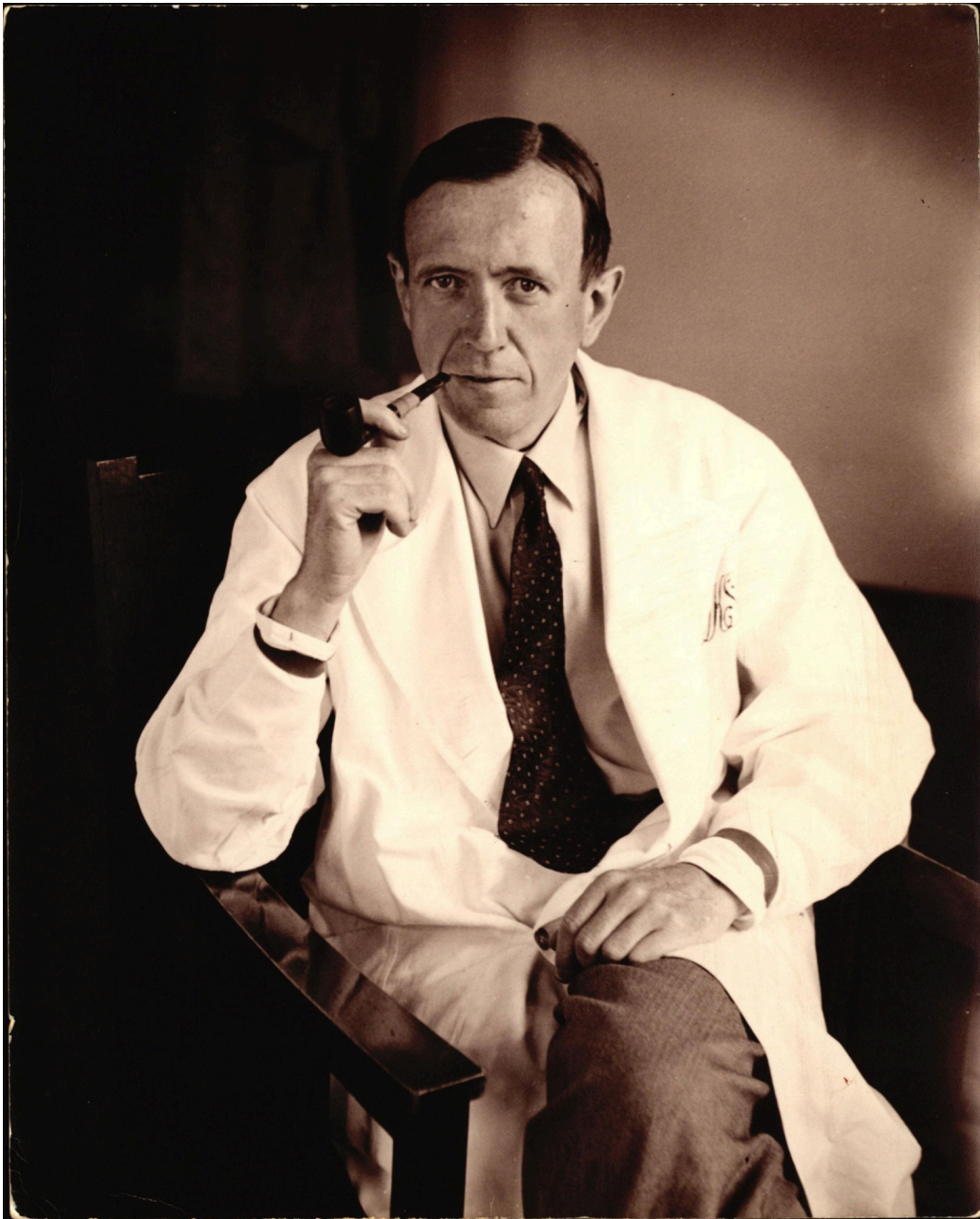


Figure 4 Hans Jacob Ustvedt at the Office of the Chief Medical Officer in Stockholm, August 1946 (25). Ustvedt was a doctor and an active member of the resistance movement. After fleeing to Sweden in 1942, he became Chief Medical Officer in Stockholm and worked actively to secure penicillin for Norway. Photo: Unknown photographer/National Archives of Norway

The Norwegian authorities abroad reacted to the fact that Sweden received penicillin before Norway. The Office of the Chief Medical Officer in Washington noted that it seemed unfair that neutral Sweden should receive the medication 'while Allied countries under occupation received nothing' (27). Although the Swedes obtained penicillin a few months before the Norwegians, they too were affected by delayed deliveries and, like Norway, had to wait for their allocated quotas (26).

It was not until 8 March 1945 that it was finally confirmed that the 300 promised ampoules of penicillin were on their way from the Swedish Ministry of Foreign Affairs to Oslo. An additional 500 ampoules were also promised in the near future (28).

By the time Norway received its first allocated supplies, the Americans had already received, a year earlier, sufficient penicillin for both civilian and military patients (2, p. 60). This must be viewed in the context of Norway being an occupied Allied country, which meant that penicillin was introduced there later and under different conditions than in the United States or the United Kingdom.

Strict priorities

In the autumn of 1944, the fighting in Northern Norway intensified. This was used as an argument to expedite the delivery of penicillin, as it was considered crucial to implement 'measures that, as far as possible, can prevent a reduction in the capacity to fight' (29). A key measure was to provide the soldiers with the best possible medical support, with particular emphasis on securing penicillin.

Norwegian authorities in Stockholm drew up a priority list as a basis for requesting and distributing penicillin (Figure 5) (29). The military was to have top priority, while the civilian population outside the most severely affected areas had to wait. The war led to increased morbidity and mortality among civilians, particularly due to a marked rise in infectious diseases and greater vulnerability to infection. Health authorities reported that in 1944 one in ten Norwegians were affected by an epidemic disease in some form. Sexually transmitted infections, particularly syphilis, posed a serious problem. Many doctors reported that wounds, including those from injuries, were slow to heal. Children and young people were mainly affected by common and mixed infections, which was a major cause of the high mortality in these age groups during the war years (30, p. 304). Many of these infectious diseases could have been cured with penicillin.

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P.M.

Eftersom den norske hjemmefronts og de norske patrioters kamp nu blir stadig hårdere, må der for disse såvel som for de norske polititropper i Sverige treffes forføyninger som såvidt mulig kan hindre nedsettelse av deres kampdyktighet.

En av disse forføyninger bør være å søke utvirket at disse kategorier stridende tilgodesees best mulig i medisinsk henseende. Et av de norske ønskemål i så måte gjelder anskaffelse av det nye amerikanske medikament penicillin.

Efter anslagsvise beregninger bør der foreløbig søkes disponert:

1. til bruk for kategorien stridende patrioter på den norske hjemmefront -
2. til de norske polititropper i Sverige
3. Dessuten vil det med muligheten av kamper i Nord-Norge ~~farvæ~~ eller ved invasjon i andre landsdeler for øye være meget ønskelig å kunne stille til disposisjon også for sivilbefolkningen i særlig hårdt rammede distrikter i Norge

De under 1 og 2 nevnte forføyninger vil kunne formidles av de norske militære instanser i Sverige, det

Figure 5 Priority list for the use of penicillin in the Norwegian population from the Norwegian Relief Central in Stockholm, dated 24 October 1944 (29). Photo: private, with permission from the National Archives of Norway, Norwegian Relief Central in Sweden

Northern Norway was prioritised for penicillin supplies ahead of the rest of the country. After Soviet forces liberated Eastern Finnmark in October 1944, the British and Americans agreed to supply penicillin directly from the United Kingdom. In December 1944, a provisional decision was made to allocate 200 ampoules to the liberated part of Norway (31). In February 1945, two crates of penicillin were sent from London via Sweden to Dr John Caspersen (1907–69) in Northern Norway (32). Caspersen acted as the representative of the civilian health authorities in the liberated areas of Finnmark from November 1944 to May 1945.

The restrictions on penicillin distribution were not limited to different segments of the population; American authorities also issued guidance on which cases should be prioritised for treatment (33).

Norwegian Penicillin Council January 1945

Among the requirements was the establishment of a supervisory body – a Norwegian Penicillin Council – similar to the one already in place in Stockholm, based on guidelines from Washington and London. This council was initially to be established for the liberated areas of Norway (34, pp. 2, 21). The Norwegian authorities were supportive of such an arrangement, as it could be expanded as more areas of the country were liberated (34, p. 1). It was crucial to put systems in place that would allow Norway to manage its penicillin supplies independently.

The Norwegian Penicillin Council was established in January 1945, consisting of Lauritz Schmidt (1901–77), a pharmacist at the Pharmacy Office, and Olaf Rømcke (1899–1968), a senior consultant at the Donor Representation (the liaison for receipt of foreign aid) in Oslo (35). Norwegian authorities in Sweden approved the newly established council (22):

'We have now received information that a robust supervisory body, with reliable members, has been established in Oslo in close liaison with the Donor Representation. This council has undertaken to ensure compliance with US regulations on the use of penicillin and to submit a report on each case treated to the National Swedish Board of Health in Stockholm.'

When Norway was finally to receive its first allocated quota of penicillin, the shipment was first sent to the Swedish Donor Representation in Oslo, with the Norwegian Penicillin Council responsible for distribution and oversight (36). The Donor Representation acted as a distribution centre under the Swedish aid organisation *Norgeshjælpen* and the Donor Committee in Stockholm, a supervisory body. The Swedish Donor Representation served as their representative in Norway, and was responsible for ensuring that Swedish aid reached the Norwegian population. In Norway, they worked closely with the Red Cross and the Norwegian aid organisation *Nasjonahjælpen* (37, p. 498).

Through Stockholm, the Donor Representation had also signed agreements with the Germans that Swedish aid sent to occupied Norway would not be confiscated (37, p. 499). This included shipments of medicines and medical equipment. The need to send goods via Sweden was partly due to British and American blockade regulations, which prohibited direct shipments to occupied Norway. Medicines and hospital supplies purchased or obtained in the United Kingdom were transported to Sweden in small consignments by air, while goods from the United States were brought on Swedish vessels to the Swedish Red Cross. In order to ensure their safe arrival, the goods were repackaged upon arrival in Sweden. All markings and labels that revealed the origin of the goods were removed and replaced with Swedish labels (37, p. 488), enabling a range of medicines and other supplies to be smuggled into Norway (30, p. 148).

The same procedure was likely followed for transporting penicillin to Norway, allowing the Norwegian government-in-exile and the Allies to prevent the Germans from obtaining the valuable medicine.

The Penicillin Council was soon also tasked with distribution in the occupied parts of the country. It was responsible for ensuring that the penicillin was correctly distributed and used for the medical conditions specified by the Americans, and only for the segments of the Norwegian population on the priority list.

Reporting requirements

After the first quota of penicillin was received in March 1945, it was some time before Norway received the next shipment. This was because the Americans would not send more until they had received reports via Stockholm on all treated cases. This proved difficult. The need was urgent, and while the Norwegians waited for further shipments, the Penicillin Council was forced to reject requests for supplies even for cases that fell within the defined indications for allocation [\(38\)](#).

The first reports that the Penicillin Council sent to the Swedes concerned the treatment of five cases in occupied Norway, at Bærum Hospital, Drammen Hospital, Menighetssøsterhjemmet Clinic and Aker Hospital (two patients) (Figure 6) [\(39\)](#). Based on age and illness, it appears that some of these patients were civilians and therefore did not fall into the categories of military personnel or of civilians from the most severely affected areas of Norway. This suggests that the Norwegians may have exercised, or been granted, greater flexibility than the Allies intended.

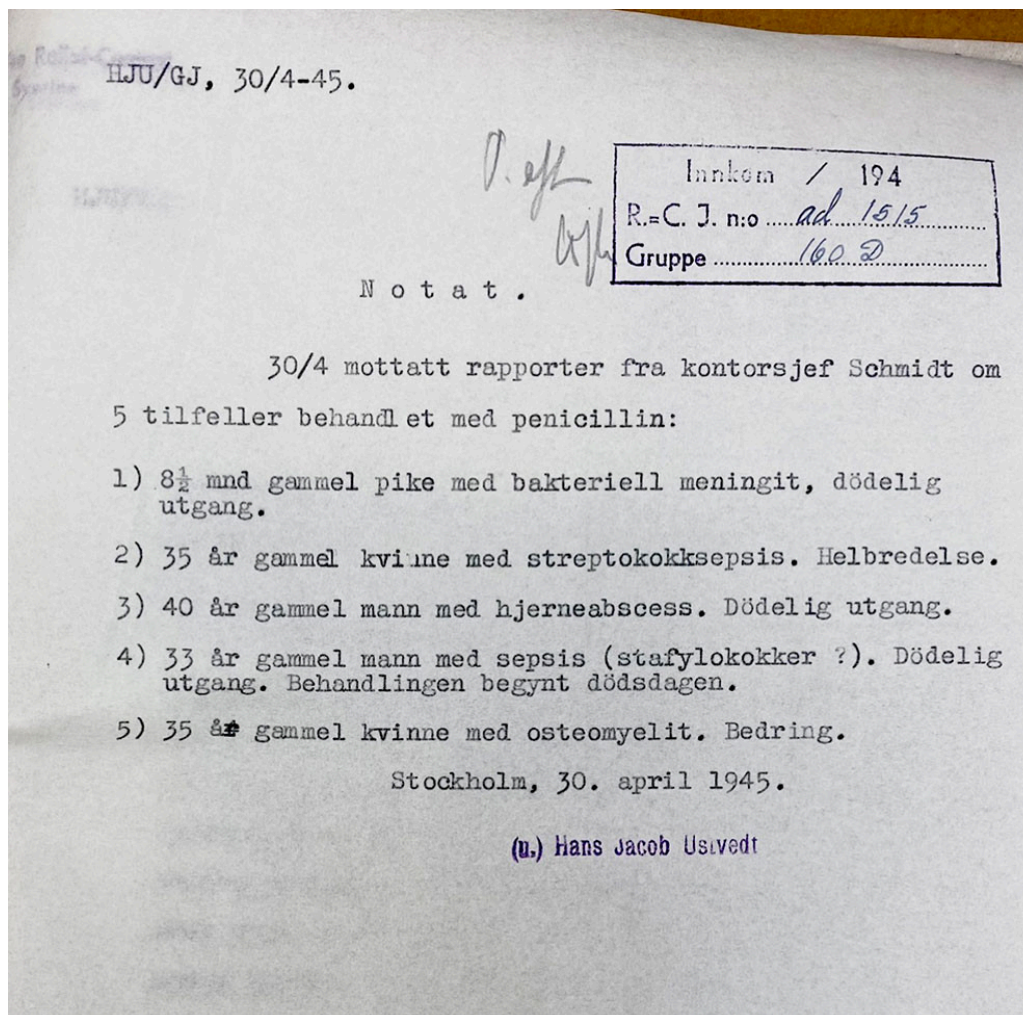


Figure 6 Memorandum concerning five cases treated with penicillin, dated 30 April 1945, just days before Norway's liberation, signed by Hans Jacob Ustvedt (39). Photo: private, with permission from the National Archives of Norway, Norwegian Relief Central in Sweden

In May 1945, just a few days before the liberation of Norway, the National Swedish Board of Health authorised the dispatch of a new quota of 500 ampoules of penicillin, even though not all reports had yet been received (40). This decision may have been due to Swedish goodwill, or recognition that the liberation of Norway was imminent, meaning that Swedish oversight would cease soon.

Challenging conditions in Norway

The distribution of penicillin in Norway presented several challenges in terms of transport and communication. The geographically elongated nature of the country made efficient distribution difficult, and it was important that the Americans, who had stipulated explicit requirements for distribution, also understood this. Norwegian authorities in Sweden highlighted this issue in a memorandum dated January 1945 (22):

'However, our Norwegian experts maintain that the current transport problems necessitate a somewhat different approach from the Swedish one in terms of the distribution of penicillin outside Oslo. Transport options are often so

limited that hospitals in certain parts of the country will have to wait several days from submission of a request for supplies until the medicine can be administered, with the result that treatment would arrive too late.'

On the Norwegian side, it was therefore proposed that the eight most important hospitals outside Oslo should each be allocated enough penicillin to treat two cases (41). As soon as one case had been treated, the hospital was to submit a report to the Penicillin Council and would then receive a new supply for the treatment of another case. The memorandum from the Norwegian authorities in Sweden noted the following: 'It is hoped that the Americans will not raise any objections to this arrangement, which in our view can be regarded as entirely satisfactory' (22). The Americans approved the arrangement.

The limitations in submitting the reports on treated patients was due to the transport problems and the arrangement for depositing penicillin at selected hospitals. As long as the ampoules were held in reserve, there was no treatment on which to report. 'It is evident that, under the present conditions, awaiting reports could have far-reaching consequences for individual patients', the Norwegian authorities argued (22). Both the Swedish and American authorities accepted this justification.

Penicillin after the war

After liberation, it took some time before Norway received enough penicillin to meet demand. It was not until the summer of 1946 that deliveries picked up: 'Supplies of penicillin have now become sufficiently regular that it could, on a trial basis, be made available for sale [...] on prescription' (42). This was barely a month after the British had begun receiving enough penicillin to meet their own needs (2, p. 61). In December 1946, the Norwegian Directorate of Health reported that '[...] all penicillin preparations can henceforth be dispensed on prescription without restriction by pharmacies' (43, 44).

Summary and conclusion

Various accounts have been reported of when penicillin first arrived in Norway. It was difficult to form a clear picture of the situation during the war, and several people may therefore have believed that they were the first to receive it. Based on archival research, we can conclude that penicillin was most likely administered for the first time to a patient with osteomyelitis in the summer or autumn of 1944. It was subsequently used sporadically, initially in liberated areas of Northern Norway, until Norway received its first standard quota of penicillin from the Americans via Sweden in March 1945.

The story of how penicillin came to Norway during World War II illustrates the immense challenges involved in obtaining and distributing life-saving medicines in a period marked by occupation, scarcity and strict prioritisation. It also serves as a reminder of how vulnerable the health service can be in times of crisis – as was seen during the COVID-19 pandemic. Today, antibiotic

resistance threatens to make even common infections life-threatening once more. Access to essential medicines cannot be taken for granted, neither in wartime nor in peacetime.

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32. Riksarkivet. Den norske Relief-Central i Sverige, AV/RA-S-2073/D/L0034/0004, Penicillin. Brev datert 2.2.1945, til Hans Jacob Ustvedt ved Medisinaldirektørens kontor i Stockholm, fra medisinaldirektør Karl Evang.

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39. Riksarkivet. Den norske Relief-Central i Sverige, AV/RA-S-2073/D/L0034/0004, Penicillin. Notat datert 30.4.1945, av Hans Jacob Ustvedt ved Medisinaldirektørens kontor i Stockholm.

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