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No. 95

**EXPERT COMMITTEE ON DRUGS
LIABLE TO PRODUCE ADDICTION**

Fifth Report

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WORLD HEALTH ORGANIZATION

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GENEVA

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**EXPERT COMMITTEE
ON DRUGS LIABLE TO PRODUCE ADDICTION**

Fifth Session

Geneva, 11-16 October 1954

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EXPERT COMMITTEE ON DRUGS LIABLE TO PRODUCE ADDICTION

Fifth Report *

The Expert Committee on Drugs Liable to Produce Addiction held its fifth session in Geneva from 11 to 16 October 1954.

The session was opened by the Deputy Director-General of the World Health Organization, who welcomed the members and referred to the many important questions which had to be considered, and towards the solution of which the help and advice of the Expert Committee was invaluable for the Organization.

1. Report on the Ninth Session of the Commission on Narcotic Drugs of the United Nations Economic and Social Council

The committee was pleased to note, in the report of the ninth session of the Commission on Narcotic Drugs of the United Nations Economic and Social Council,¹ references to the work of WHO and its Expert Committee on Drugs Liable to Produce Addiction, indicative of the very close co-operation which has been developed between the two organizations. It was gratified also by the repeated statements of appreciation by the commission for the assistance which WHO has rendered it.

* The Executive Board, at its fifteenth session, adopted the following resolution:
The Executive Board,

1. ADOPTS the fifth report of the Expert Committee on Drugs Liable to Produce Addiction;
2. THANKS the members of the Committee for their work; and
3. AUTHORIZES publication of the report.

(Resolution EB15.R3, *Off. Rec. Wld Hlth Org.* 1955, 60, 2)

¹ United Nations, Economic Social Council (1954) *Economic and Social Council. Official Records : eighteenth session. Supplement No. 8. Commission on Narcotic Drugs : report of the ninth session (19 April to 14 May 1954)*, New York (Document E/2606—E/CN.7/283)

2. Resolutions of the United Nations Economic and Social Council

The committee took note of resolution 548 (XVIII) I on drug addiction adopted by the United Nations Economic and Social Council.¹ While recognizing the difficulties inherent in the collection of adequate statistics on the incidence of and manner of handling addiction in different countries, the committee wished to express its appreciation of the effort made and the procedure recommended for gathering this essential information.

The committee took note of a number of other resolutions of the Economic and Social Council which have a specific relation to items of its agenda ; appropriate reference will be made thereto as these items are discussed.

3. Interpretation of "Convertibility" by the World Health Assembly

Having considered the interpretation of "convertibility" which the Seventh World Health Assembly² decided was applicable so far as the functions conferred upon WHO by the 1931 Convention for Limiting the Manufacture and Regulating the Distribution of Narcotic Drugs are concerned, the committee was of the opinion that this decision set forth the guiding principles upon which it could base its judgments, but that each case where convertibility comes into question must be judged individually.

4. Exercise by WHO of Functions conferred by International Conventions on Addiction-Producing Drugs

The committee was gratified to note the decision of the Seventh World Health Assembly³ which would materially expedite, in the interests of public health, the transmission and bringing into effect of its opinions with respect to addiction liability and the need for control of specific substances.

¹ United Nations, Economic and Social Council (1954) *Economic and Social Council. Official Records: eighteenth session, 29 June - 6 August 1954. Supplement No. 1. Resolutions*, Geneva, p. 19 (Document E/2654)

² *Off. Rec. Wld Hlth Org.* 1954, **55**, 19 (resolution WHA7.7)

³ *Off. Rec. Wld Hlth Org.* 1954, **55**, 19 (resolution WHA7.6)

5. Morphine and its Derivatives

5.1 *Situation regarding diacetylmorphine (heroin)*

The Expert Committee on Drugs Liable to Produce Addiction,

Having noted resolution 548 (XVIII) G of the United Nations Economic and Social Council¹ on the problem of diacetylmorphine:

Having received information that another of the countries which has heretofore considered this substance indispensable has decided to prohibit the drug's importation as of 1 January 1955, thus terminating use when present stocks are exhausted, and

Realizing that this now leaves only six countries which have not yet abolished or have not expressed an intention to abolish the use of diacetylmorphine,

WISHES to draw attention to the very material progress which has been attained within a period of five years towards a complete recognition of the dispensability of diacetylmorphine. This progress has been materially assisted by the increasingly general acceptance by national and international bodies of the committee's view as to the replaceability of diacetylmorphine, in particular by less dangerous synthetic substances, and by the efforts of independent investigators whose comparative studies, appearing from time to time in the medical press, have afforded supporting evidence to this view.

5.2 *6-Methyldihydromorphine*

Referring to the notification of the Government of the United States of America, the committee was of the opinion that 6-methyldihydromorphine, because it (1) produces morphine-like effects, (2) will suppress abstinence phenomena of a known morphine addiction, and (3) will sustain a morphine addiction, must be considered an addiction-producing drug comparable to morphine, and that 6-methyldihydromorphine and its salts should fall under the regime laid down in the 1931 Convention for the drugs specified in Article 1, paragraph 2, Group I, sub-group (a). Therefore,

The Expert Committee on Drugs Liable to Produce Addiction

RECOMMENDS that its opinion with respect to 6-methyldihydromorphine and its salts be communicated to the Secretary-General of the United Nations.

¹ United Nations, Economic and Social Council (1954) *Economic and Social Council, Official Records: eighteenth session, 29 June - 6 August 1954. Supplement No. 1. Resolutions*, Geneva, p. 18 (Document E/2654)

5.3 *Dihydrohydroxymorphinone*

Referring to the notification of the Government of the United States of America, the committee was of the opinion that dihydrohydroxymorphinone,¹ because it (1) produces morphine-like effects, (2) will suppress abstinence phenomena of a known morphine addiction, and (3) will sustain a morphine addiction, must be considered an addiction-producing drug comparable to morphine, and that dihydrohydroxymorphinone and its salts should fall under the regime laid down in the 1931 Convention for the drugs specified in Article 1, paragraph 2, Group I, sub-group (a). Therefore,

The Expert Committee on Drugs Liable to Produce Addiction

RECOMMENDS that its opinion with respect to dihydrohydroxymorphinone and its salts be communicated to the Secretary-General of the United Nations.

The committee noted further that the evidence accompanying the notification with respect to dihydrohydroxymorphinone indicated that this substance possesses particularly dangerous addiction-producing properties, and was of the opinion that other less dangerous drugs offer equal therapeutic advantage. Therefore,

The Expert Committee on Drugs Liable to Produce Addiction

RECOMMENDS that its opinion with regard to the dangerousness of dihydrohydroxymorphinone, its salts, its preparations, and preparations of its salts be transmitted to the Secretary-General of the United Nations, emphasizing the desirability of avoiding the manufacture, import, and export of dihydrohydroxymorphinone.

5.4 *Myristyl ester of benzylmorphine*

Referring to the notification of the Government of the United States of America, the committee was of the opinion that there was no evidence that the myristyl ester of benzylmorphine possesses addiction liability. Nevertheless, it had specific information that this substance was readily convertible to benzylmorphine or morphine in yields of at least 50% to 60%. It was of the opinion that this represents a degree of convertibility which constitutes a risk to public health. Therefore,

The Expert Committee on Drugs Liable to Produce Addiction

RECOMMENDS that its opinion with respect to the convertibility of the myristyl ester of benzylmorphine be communicated to the Secretary-General of the United Nations.

¹ Dihydro-14-hydroxymorphinone is the morphine analogue of dihydrohydroxycodone. The proposed international non-proprietary name of the latter is "oxycodone".

5.5 *Retard preparations and mixtures of addiction-producing substances with other agents*

The committee noted the continuance of efforts to prepare morphine for therapeutic use in a form which will prolong its effectiveness, and the combination of morphine or morphine-like substances with antagonists such as nalorphine to render their use safer and less liable to undesirable side-effects. It recognized the desirability of such objectives but wished to reiterate its opinion that the various means employed to attain them in no way affect the essential addiction-liability of the morphine or morphine-like component. Therefore, the committee concluded that preparations of these types must be handled and controlled in all respects exactly as are their addiction-producing components.

6. Narcotine

The committee took note of a report prepared by the Addiction Research Center, Public Health Service Hospital, Lexington, Kentucky, USA, with respect to the testing of narcotine for addiction liability. The committee accepted the evidence in this report and agreed with the conclusion that narcotine has no addiction liability.

7. Synthetic Substances with Morphine-like Effect

7.1 *General aspects*

The committee took note of a report on work in progress to obtain a screening method for determining addiction liability using the monkey as the test subject. A regimen of regular multiple administration of a drug throughout each 24 hours with periodic assessment of the incidence and degree of development of physical dependence has been set up. The committee was most interested in the evaluation of substances by this method and the degree of parallelism between the results so far obtained and those previously observed with human beings. It was of the opinion that the results were most encouraging in that they gave promise that the original objective could be attained, thus expediting classification of addiction-producing agents.

7.2 *Synthetic substances of methadone type*

7.2.1 *4,4-Diphenyl-6-dimethylamino-3-hexanone*

Referring to the notification of the Government of the United States of America, the committee was of the opinion that 4,4-diphenyl-6-di-

methylamino-3-hexanone (also called "diphenyldimethylaminoethylbutanon"), because it (1) produces morphine-like effects, (2) will suppress abstinence phenomena of a known morphine addiction, and (3) will sustain a morphine addiction, must be considered an addiction-producing drug comparable to morphine, and that 4,4-diphenyl-6-dimethylamino-3-hexanone and its salts should fall under the regime laid down in the 1931 Convention for the drugs specified in Article 1, paragraph 2, Group I. Therefore,

The Expert Committee on Drugs Liable to Produce Addiction

RECOMMENDS that its opinion with respect to 4,4-diphenyl-6-dimethylamino-3-hexanone and its salts be communicated to the Secretary-General of the United Nations.

In its fourth report,¹ the committee considered a preparation containing 4,4-diphenyl-6-dimethylamino-3-hexanone and *p*-oxyphenylmethylamino-propanol. The committee has repeatedly expressed the opinion that mixtures containing a substance liable to produce addiction, of which the mixture just referred to is an example, should be handled and controlled in all respects exactly as the addiction-producing component. Confirming this view, evidence is now available not only that the component of this mixture, 4,4-diphenyl-6-dimethylamino-3-hexanone, must be considered an addiction-producing substance, but also that the mixture itself is capable of sustaining an established addiction.

7.2.2 β -4,4-Diphenyl-6-dimethylamino-3-heptanol (*beta*-methadol)

Referring to the notification of the Government of the United States of America, the committee concluded that β -4,4-diphenyl-6-dimethylamino-3-heptanol has little or no addiction liability since (1) it has not induced any evidence of morphine-like effect, and (2) it has failed completely to suppress the abstinence phenomena of a known morphine addiction. Nevertheless, the committee had specific information that β -4,4-diphenyl-6-dimethylamino-3-heptanol is readily convertible to acetyl derivatives in good yield. The acetyl derivatives have been proved to possess addiction-producing properties.² Consequently, the committee was of the opinion that the convertibility of β -4,4-diphenyl-6-dimethylamino-3-heptanol could be accomplished with such ease and in such yield as to constitute a risk to public health, so that β -4,4-diphenyl-6-dimethylamino-3-heptanol and its salts should fall under the regime laid down in the 1931 Convention for the drugs specified in Article 1, paragraph 2, Group I. Therefore,

¹ *Wld Hlth Org. techn. Rep. Ser.* 1954, 76, 8 (section 4.2)

² *Wld Hlth Org. techn. Rep. Ser.* 1954, 76, 7 (section 4.2)

The Expert Committee on Drugs Liable to Produce Addiction

RECOMMENDS that its opinion with respect to β -4,4-diphenyl-6-dimethylamino-3-heptanol and its salts be communicated to the Secretary-General of the United Nations.

7.2.3 *4,4-Diphenyl-6-piperidino-3-heptanone*

Referring to the notification of the Government of the United Kingdom of Great Britain and Northern Ireland, the committee noted experimental evidence that 4,4-diphenyl-6-piperidino-3-heptanone (designated in the notification as 6-piperidino-4 : 4-diphenylheptan-3-one) has methadone-like properties with respect to addiction potentiality as well as with respect to other morphine-like properties. Consequently, the committee was of the opinion that 4,4-diphenyl-6-piperidino-3-heptanone must be considered an addiction-producing drug comparable to morphine, and that it and its salts should fall under the regime laid down in the 1931 Convention for the drugs specified in Article 1, paragraph 2, Group I. Therefore,

The Expert Committee on Drugs Liable to Produce Addiction

RECOMMENDS that its opinion with respect to 4,4-diphenyl-6-piperidino-3-heptanone and its salts be communicated to the Secretary-General of the United Nations.

7.3 *Synthetic substances of pethidine type*

7.3.1 *1-Methyl-4-phenylpiperidine-4-carboxylic acid, isopropyl ester*

Referring to the notifications of the Governments of Italy and the United States of America, the committee took into account the opinion expressed in its first report,¹ namely, that other compounds of a type of structure similar to pethidine and methadone must be under suspicion as to their having addiction-producing properties until the contrary be proved. Accordingly, the isopropyl and other esters of 1-methyl-4-phenylpiperidine-4-carboxylic acid must be suspected of having addiction-producing properties, because general pharmacological experience indicates that in compounds of this type the change from the ethyl to the isopropyl or other ester can effect no significant qualitative change in, and can be expected to effect no major quantitative change in, the action of the compound. Therefore, the committee was of the opinion that all esters of 1-methyl-4-phenylpiperidine-4-carboxylic acid and their salts must be considered as addiction-producing drugs comparable to morphine, and that all these esters and their salts should fall under the regime laid down in the

¹ *Off. Rec. Wld Hlth Org.* 1949, 19, 31 (section 8)

1931 Convention for the drugs specified in Article 1, paragraph 2, Group I. Therefore,

The Expert Committee on Drugs Liable to Produce Addiction

RECOMMENDS that its opinion with respect to the isopropyl and other esters of 1-methyl-4-phenylpiperidine-4-carboxylic acid and their salts be communicated to the Secretary-General of the United Nations.

7.3.2 *Situation concerning the abuse of pethidine among physicians and members of the para-medical professions*

The Expert Committee on Drugs Liable to Produce Addiction,

Having considered a report on pethidine addiction as encountered at the Public Health Service Hospital, Lexington, Kentucky, USA ;¹

Noting the high incidence of such addiction among members of the medical, nursing, and associated professions ;

Considering that an important factor in the development of pethidine addiction not only in the United States of America but also in other countries has been the attitude of physicians towards the drug based upon the widespread belief that it is less dangerous in this respect than morphine ; and

Being convinced that experience with the drug, experimental and in clinical practice, is contrary to this belief,

IS OF THE OPINION that pethidine is as dangerous as morphine as a potential addicting agent, that its use should be undertaken only with full realization of this danger, and that its administration should be approached with the same attitude and attended by the same precautions as are recognized for morphine ; and therefore,

URGES that the Director-General of WHO, by whatever means he may deem appropriate, bring to the attention of governments and the medical profession throughout the world the dangerousness of the addiction potentiality of pethidine and the need for the same care in its use as with morphine.

8. Synthetic Substances of Azacycloheptane Type

The committee took note of a report on a new group of substances of azacycloheptane (hexamethyleneimine) type, which have been shown to exhibit significant analgesic action, but so far have shown no addiction-producing or addiction-sustaining properties.

¹ See annex, page 13.

9. Synthetic Substances of Other Types

The committee also noted a report on the development of a new series of compounds of phenylcyclohexane, phenylmorphane, and benzmorphane types. In at least one member of this series analgesic action of an intensity approximately equivalent to that of morphine has been observed. No tests for addiction liability have been made with any member of this series.

10. International Non-Proprietary Names

The Expert Committee on Drugs Liable to Produce Addiction,

Having considered resolution 548 (XVIII) BII of the United Nations Economic and Social Council,¹ which says in part that "for the purpose of ensuring effective narcotics control, it is highly desirable that the existing complicated and slow procedure for the establishment of such names for newly-developed narcotics should be simplified and speeded up as much as possible";

Agreeing completely with this resolution, and

Recognizing that the delays accompanying the present mechanism for the selection of international non-proprietary names may result in embarrassment when a government is required to bring under international narcotics control a substance which can be designated only by a complex chemical name;

Considering that what is desired by all concerned is an earlier selection at least of a proposed international non-proprietary name for a drug to be brought under international narcotics control, and

Considering that this selection should be made early enough to render it possible for the Director-General of WHO to send such a name to the Secretary-General of the United Nations simultaneously with the verbal note transmitting the finding, based upon the work of this committee, that a new drug is to be brought under international narcotics control,

IS OF THE OPINION that the desired objective might be attained:

(a) if a government having information concerning a drug which may lead to a notification under international narcotics conventions could take steps to suggest non-proprietary names¹ for that substance;

¹ United Nations, Economic and Social Council (1954) *Economic and Social Council. Official Records: eighteenth session, 29 June - 6 August 1954. Supplement No. 1. Resolutions*, Geneva, p. 15 (Document E/2654)

(b) if a government having prepared a notification for transmittal to the Secretary-General of the United Nations could send simultaneously to the Director-General of WHO information concerning such a notification together with the suggested non-proprietary names; and

(c) if, when the Director-General of WHO has received such information, the Subcommittee on Non-Proprietary Names of the Expert Committee on the International Pharmacopoeia could select as soon thereafter as possible a proposed international non-proprietary name for the substance in question to the end that the name shall be available by the time the Expert Committee on Drugs Liable to Produce Addiction considers the respective notification; therefore,

RECOMMENDS that the Director-General of WHO consider the above suggestions and take such action as he deems appropriate.

11. Mastication of the Coca Leaf

The Expert Committee on Drugs Liable to Produce Addiction,

Having considered resolution 548 (XVIII) E of the United Nations Economic and Social Council² on the problem of the coca leaf,

WAS PLEASED to note the recognition in that resolution of coca-leaf chewing as a form of addiction,³ and that steps were recommended towards its eventual eradication.

12. Situation concerning Cannabis sativa

The committee considered the report of the Inter-Departmental Committee on the Abuse of Dagga,⁴ informing it of (1) the existence in the Union of South Africa of widespread addiction to cannabis, always by smoking, (2) the feeling among the South African police of a relationship

¹ More than one name is desirable in order to avoid conflicts and other difficulties in selecting a proposed international non-proprietary name.

² United Nations, Economic and Social Council (1954) *Economic and Social Council. Official Records: eighteenth session, 29 June - 6 August 1954. Supplement No. 1. Resolutions*, Geneva, p. 17 (Document E/2654)

³ *Wld Hlth Org. techn. Rep. Ser.* 1952, 57, 10 (section 6.2); *Wld Hlth Org. techn. Rep. Ser.* 1954, 76, 10 (section 6)

⁴ Union of South Africa, Inter-Departmental Committee on the Abuse of Dagga (1951) *Report ...*, Pretoria (Publication U.G. No. 31/1952)

between cannabis addiction and crime, (3) evidence of permanent deterioration as the result of the addiction, and (4) evidence that, as in other parts of the world, cannabis abuse is very likely to be a forerunner of addiction to opiates.

The committee was pleased to note the steps taken by the Government of the Union of South Africa to assess and control the cannabis situation in the Union.

The committee was also pleased to note information on improvement in the cannabis situation in India. Evidence from India, however, confirmed the development of permanent deterioration as the result of the abuse of cannabis.

The committee was of the opinion that cannabis abuse comes definitely under the terms of its definition of addiction, that the abuse of cannabis is still a serious problem in many parts of the world, and that not only can there be no abatement in control procedures but there should also be extension of the effort towards the abolition of cannabis from all legitimate medical practice.

Annex

ADDICTION TO PETHIDINE HYDROCHLORIDE *

Since pethidine became available there has been a substantial increase in the production and consumption of the drug. This upward trend has occurred and is occurring in many parts of the world. For example, in 1946, in the United States of America, 123 362 ounces (3497.254 kg) of pethidine were produced and 101 102 ounces (2866.194 kg) consumed, while in 1952, 251 009 ounces (7115.986 kg) were produced and 283 162 ounces (8027.509 kg) consumed. Concomitantly, the number of pethidine addicts, as reflected in admissions to the Public Health Service Hospital in Lexington, Kentucky, USA, has increased considerably.

The material of the present report was obtained by reviewing the records of all pethidine addicts, classified as primary or secondary, admitted

* Résumé prepared by N. B. Eddy with the consent of the authors from a paper by R. W. Razor and H. J. Crecraft, Public Health Service Hospital, Lexington, Kentucky, USA. The original paper was read before the Committee on Drug Addiction and Narcotics of the National Research Council at its fourteenth meeting in Rensselaer, N.Y., 1-2 October 1954, and has been submitted for publication in the *Journal of the American Medical Association*.

to the Public Health Service Hospital in Lexington, between 1 July 1950 and 30 September 1953. An individual was considered to be a primary pethidine addict if he (a) had never used opiates or synthetic analgesics except pethidine; (b) was addicted to pethidine but had also received an occasional dose of an opiate or other synthetic analgesic, although never enough of either to produce an addiction; or (c) was addicted originally to pethidine but later became addicted to another narcotic either in addition to or instead of pethidine. Secondary pethidine addicts were individuals who had been addicted originally to opiates or synthetic analgesics other than pethidine but were addicted to pethidine alone or in combination with another narcotic at the time of their most recent admission.

TABLE I. CHARACTERIZATION OF PETHIDINE ADDICTS

	Males	Females	Total
Number of pethidine addicts admitted to hospital 1 July 1950 - 30 September 1953	264	193 ^a	457
Primary addictions :	168	120	288
(a) used pethidine only	132	86	218
(b) used pethidine plus non-addicting amounts of other narcotics	29	28	57
(c) first addicted to pethidine but changed to other narcotic ^b	7	6	13
Secondary addictions	96	73	169
Average age at onset of primary pethidine addiction (years) ^c	38	34	
Average duration of primary pethidine addiction (years)	2.7	1.8	
Average duration of addiction to narcotics for sec- ondary pethidine addictions (years)	5	8	
Pethidine addicts of coloured races ^d			10
Pethidine addicts seeking treatment voluntarily ^e			416
Pethidine addict prisoners serving sentences for nar- cotics violations			41
Primary pethidine addicts admitted only once during period of study			237
Primary pethidine addicts admitted twice ^f			39

^a In 1953, 25% of all addicts admitted to the hospital were female.

^b The most frequent reason given for change to another drug was the development of toxic reactions to large doses of pethidine.

^c For all admissions, the age at onset of opiate addiction was usually in the late teens or early twenties.

^d Of all admissions, 40% were coloured.

^e Of all admissions, 84% applied voluntarily for treatment.

^f Of all types of addicts admitted in 1952, 65% were first and second admissions. One third of the voluntary pethidine addicts, but only one fourth of all voluntaries, remained in hospital for the full period of treatment.

The total number of pethidine addicts admitted during the period under study was 457, about 141 per year. In 1946-7 only 6 pethidine addicts entered the hospital. In table I the whole group of pethidine addicts has been broken down according to various characterizing factors and some notes have been added comparing the group with addicts in general.

The reasons given by pethidine addicts for the use of the drug at the onset of their addiction are summarized in table II. As might be expected from the high incidence of medical complaints and the fact that synthetic analgesics were not readily available through narcotics pedlars, the majority of patients said that physicians were their primary source of pethidine supply. Among primary addicts, 125 stated that they received pethidine from physicians only; 50 supplemented their supply by forging prescriptions or by stealing from the hospital in which they worked. Among secondary pethidine addicts, the sources of supply were similar, but these individuals were more inclined to turn to other drugs when their source of pethidine was threatened.

TABLE II. REASONS GIVEN BY PETHIDINE ADDICTS FOR ONSET OF ADDICTION

	Primary addicts		Secondary addicts	
	Males	Females	Males	Females
Relief of chronic depression, tension, anxiety, and fatigue	29	41	5	14
Premenstrual tension and dysmenorrhoea		26		5
Alcoholic "hang-over"	24	7	21	5
Post-operative pain ^a	14	8	15	19
Post-traumatic pain ^b	18	9	15	3
Relief of diverse medical complaints . . .	81	44	25	20
Relief of symptoms of psychosis		1	1	
No reason given	2	10	14	12

^a Most females in this group gave a history of polysurgery, ranging from 6 to 49 major surgical procedures.

^b Trauma was most commonly due to automobile accidents.

Nearly 50% of male and 36% of female pethidine addicts resided in the south-eastern United States, in contrast to 22% of all addicts admitted from the same area in 1953. Also, a third of all individuals addicted to pethidine came from communities of less than 10 000 population, whereas a considerable majority of persons addicted to other drugs came from the very large metropolitan areas, cities of 1 000 000 population or greater.

Of the 457 pethidine addicts, 76 were physicians, 79 were nurses, 2 were dentists, and 29 were from ancillary professions—a total of 186, or 41%. When members of this group were interviewed, it was learned that, while they were aware vaguely of the danger of becoming addicted, they regarded the danger of addiction as less than with any of the other common narcotics and felt that pethidine could be discontinued more easily. Also, pethidine was more easily available; many hospitals took less precaution to safeguard pethidine supplies. Many felt that less stigma was attached to the use of pethidine, and that the observable signs of pethidine addiction were less obvious to others than the signs of addiction to opiates.

The data gathered in this study leave no doubt that addiction to pethidine does occur; individuals who have never been addicted to opiates do become addicted to pethidine and have symptoms of abstinence following withdrawal of the drug. The incidence of pethidine addiction, as reflected by admissions to the Lexington hospital, seems to be increasing.

The fact that the majority of pethidine addicts were placed on the drug and later maintained on it by physicians as part of the therapy of some chronic medical or psychiatric condition seems to indicate that the medical profession is not sufficiently aware of the danger of addiction to this drug. Failure to appreciate the addiction properties of pethidine may also account in part for the high proportion of physicians, nurses, and members of allied professions found among pethidine addicts. It should be emphasized that the same precautions should be taken in prescribing pethidine as are taken in prescribing morphine.