

ADVISORY SUB-COMMITTEE ON HUMAN APPLICATIONS

of the

INTERIM ADVISORY COMMITTEE ON ISOTOPE DISTRIBUTION POLICY

Minutes of Initial Meeting - Held June 28, 1946; Oak Ridge, Tennessee

Members Present: A. H. Dowdy, Chairman

G. Failla

Member Absent: H. L. Friedell

Others Present: P. C. Aegersold, Secretary of the Committee

W. E. Cohn, Consultant on Clinton Laboratories Production

K. Z. Morgan, Consultant on Health-Physics

Main Items Discussed:

1. Report on the Meeting of Sub-Committee on Allocation
2. Functions of the Sub-Committee on Human Applications
3. Production Allocation for Therapeutic and Diagnostic Uses
4. Allocation of Available Materials by Institution
 - a. Regular basis
 - b. Temporary irregular basis
5. Allocation of Available Materials by Intended Use
 - a. Types of Uses
 - b. Specific Uses for Certain Isotopes
6. Mechanism for Handling Requests

1. Report on Meeting of Sub-Committee on Allocation

Dr. Aegersold reported on the discussions and conclusions of the initial meeting of the Sub-Committee on Allocation. These are contained rather completely in the final minutes of the meeting and will not be repeated here. The conclusions on the related functioning of the two sub-committees are given in the next section.

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BOX No. 3

FOLDER Isotopes

2. Functions of the Sub-Committee on Human Applications.

These functions as interpreted by the Sub-Committee on Allocation were reviewed (see Conclusions on Discussion Item 4, Minutes of Sub-Committee on Allocation). The recommendations of the Sub-Committee on Allocation were adopted. One comment was added, however; namely, although it is desirable that the Sub-Committee on Allocation make the priority ratings on requests for tracer (non-diagnostic) experiments in humans, members of the Sub-Committee on Human Applications can recommend high priority for experiments they feel particularly worthwhile.

Functions of the Sub-Committee, other than the exercising of a veto power on allocation for human application, were then considered. These logically are:

a. Recommend for main committee action the relative production effort to be placed on isotopes for therapeutic and diagnostic application.

b. Recommend for Isotopes Branch action the allocation of available materials for therapeutic and diagnostic applications.

These functions are considered in the next sections.

3. Production Allocation for Therapeutic and Diagnostic Use.

At the present time a discussion of the production effort to be placed on radioisotopes for therapeutic and diagnostic uses as compared with other uses narrows down to a consideration of the production effort to be placed on a few isotopes, which are at present in most apparent demand, namely I 131, P 32, Sr 89, ⁹⁰Co, Co 60 and Na 24. This does not mean that radioisotopes other than these five will not be useful for therapeutic and diagnostic purposes, but only that such usefulness of others is as yet highly investigational and problematical. The demand for other radioisotopes for human use, even if for the purpose of finding out therapeutic and diagnostic possibilities, will be initially for tracer investigations and will probably not involve routine regular supplying of material.

I 131. This isotope, because of its very specific absorption in thyroid tissue, gives promise of being more uniquely useful (i.e., more specific in results in certain malfunctions) than may be the case for the other four above listed isotopes. Some of the previous successful therapeutic applications of radioiodine have been with I 130, which has only a 12.6 hour half-life (not made with the pile). The 8 day I 131 requires a different dosage technique and there is some question concerning possible effects on the kidneys of the longer period radiation. Nevertheless, I 131 has promise of being quite useful in certain carcinomas of the thyroid and in exophthalmic goiter (Grave's disease).

Fission production I 131 is not as readily available a source of radioiodine as the uninitiated might believe. Irradiated uranium is generally "cooled" for a fairly long time to avoid the hazards and other difficulties of working with "hot" material. A great deal of the radioiodine is therefore necessarily lost by decay alone. The Clinton pile is used mainly for experimentation and cannot be considered a regular source of discharged uranium. Recovery of radioiodine from the plutonium process at Hanford would require a considerable

installation (also time). Rapid shipping of radioiodine from Hanford for processing and distribution at Clinton would be expensive and at best several half-lives might pass before actual delivery to the requestor. This adds up to making irradiated tellurium the most readily available source of I 131.

The limitation on I 131 from Te at present is in manpower and extraction facilities. Dr. Cohn estimated that up to 50 mc/day of carrier free separated I 131 could be made by pushing the present extraction facilities. More I 131 than this might be made available in irradiated Te to those with satisfactory extraction facilities. In the future the limitation on I 131 production may be the competition for pile neutrons in the making of other demanded isotopes.

The sub-committee felt that this I 131 production should take care of the most legitimate, immediate demands. As the demand becomes more clear in the future, the apportionment of production effort (neutrons absorbed plus manpower) between various isotopes and their uses can be determined by the main committee.

P 32 . The high specific activity most generally demanded for therapeutic use of this isotope can be met by the Clinton pile only by the irradiation of sulphur. In order for this method of production not to detract seriously from the pile production of other radioisotopes, not more than two curies/month of P 32 can be produced. Routine large scale facilities are under development for the extraction of P 32 from S, but at present P 32 in quantities for clinics can be furnished to requestors only in the irradiated S. Some quantities of extracted P 32 will now be available for tracer work, and later increasing amounts for therapy. The schedule and rate of extracted P 32 production cannot be predicted until more experience is gained in production development.

Since not many clinics have facilities for extracting P 32 from irradiated sulphur, the allocation of production effort on P 32 will not become a problem until extracted P 32 can be supplied. The anticipated production should supply 20 or more qualified clinics for the most appropriate uses of the isotope.

Sr 89,90. This fission-product radiostrontium may be used as a substitute for P 32 in certain cases and may have especially desirable irradiation properties of its own. Sr 89 has a 53 day half-life which is sufficiently long to make it necessary to be cautious with the quantities administered. Sr 90 of about 25 year half-life will also be present in radiostrontium extracted from fission products. Since Sr 90 decays to Y 90, which has a short half-life, the Sr 90 can result in a considerable rate of beta irradiation for a long period of time. If the order of not more than 1% of the beta disintegrations result from the presence of Sr 90, the material can probably be used safely for therapeutic investigations. This may mean the processing of rather newly irradiated uranium (not "cooled" long enough for Sr 89 to decay appreciably). Since the therapeutic techniques of using this material will have to be developed and since equipment is already available at Clinton Laboratories for its extraction, it is not anticipated that allocation of production effort will be an immediate problem in making Sr 89,90 available for therapeutic investigations.

Co 60. The demand for this 5.3 year half-life isotope is mainly for use as a substitute for radium gamma ray sources. Co 60 has an advantage over radium in some uses because of its almost monoenergetic spectrum of gamma radiation (1.1-1.3 Mev) and its soft monoenergetic beta rays (0.3 Mev). The therapeutic

demand would be substituted for radium needles and packs for cancer therapy. Although this may be a practical and worthwhile application of an induced radioisotope, it is not an application which can be uniquely performed by the use of this radioisotope. Radium and supervoltage X-rays are now available for cancer therapy on a rather large scale. If the Co 60 sources could be made cheaper and more convenient to use than radium sources, there would be a legitimate demand for Co 60 which might take a sizable fraction of the overall production effort. It is not anticipated that the problem will be immediate, since a dosage and application technique would have to be developed for Co 60 sources which might take considerable time. The sub-committee voted not to consider allocation of Co 60 for therapeutic use until it became clear that production for this purpose would not interfere with production for high priority applications of radioisotopes.

Na 24. This 14.8 hr. half-life isotope is useful for giving whole-body irradiation of patients and for studying blood circulation in certain diagnostic applications. Because of its short half-life there would be considerable difficulty in efficient wide-scale distribution. The yield of the isotope is rather high, however, and the production relatively easily achieved. It is not anticipated therefore that the allocation of production effort on Na 24 for therapeutic and diagnostic uses will be an immediate problem.

It appears, consequently, that the most immediate problem of allocation of production effort will arise for I 131. As soon as extracted P 32 is available the problem may also arise in this case. The problem might not become acute until more institutions have staffs and facilities suitable for therapeutic application of such isotopes. When the necessary production effort to meet such demands begins to interfere appreciably with that for more fundamental uses of radioisotopes, a policy decision on allocation of production effort will have to be made by the main committee. The sub-committees may however make recommendations on such matters.

In case confusion may arise as to whether or not a request is for therapeutic purposes, the following definitions were made;

a. Therapeutic use - a use in which there is a definite attempt to cure or alleviate a malfunction. (A tracer dose in general, even if used in studying a malfunction, could not be seriously considered as affording radiation treatments.)

b. Diagnostic or therapeutic test - a test made in a human being, which may be made with larger than usual tracer amounts, to determine malfunction and/or the desirability of some form of treatment (Examples: circulation in a gangrenous extremity and uptake of I 131 in a carcinoma of the thyroid.)

4. Allocation of Available Materials by Institution.

a. Regular basis

As pointed out previously the production and extraction of P 32 and I 131 for therapeutic use is still under development. No satisfactory schedule and rate for the production of the extracted isotopes can now be given. It is obviously too early therefore to make commitments concerning a regular or "permanent" rate of allocation of these isotopes, or for that matter any others to be used in large quantities.

The sub-committee recommended that, before any allocation commitments are made for a regular clinical supply, a survey be made of the actual needs of the clinical institutions which are known to be carrying on a program or to have expressed a desire to initiate a program for the proper clinical use of radioisotopes. Although some sketchy surveys have been made previously, the proposed one will be more thorough. Moreover, it will be based on actual demands, inasmuch as price lists, procurement regulations, and request forms will be furnished the institutions canvassed.

A list of the clinical investigation institutions that will be included in the survey is appended. It is not known to what extent other institutions may be interested and qualified.

Dr. Dowdy submitted the following recommendations as a basis for radioisotope distribution for human applications. They were wholeheartedly adopted by those present. They will be made known to the canvassed institutions as being the policies of the sub-committees on allocation and on human applications in regard to the clinical use of radioisotopes. Only those institutions which can qualify under those policies will be eligible for allocation. The amounts regularly allocated would be apportioned on a fair basis among the institutions finally selected on the basis of the survey.

Suggested Recommendations on Allocation for Human Applications:

"The following recommendations, if made policies by the Interim Advisory Committee on Isotope Distribution Policy, I believe, would greatly facilitate the equitable and effective distribution of isotopes for human use.

(1) The Committee should initially select a group of accredited medical schools, hospitals, and clinics who may be eligible to receive radioactive isotopes.

(2) Each selected hospital, medical school, and clinic should be invited to appoint a local committee composed of a Chairman and whatever number of members they should see fit to pass upon all requests originating from their institution.

(3) All isotope requests to the Isotopes Branch of the Research Division of the Manhattan District for human use for their particular institution should be initiated by the local Chairman.

(4) The Committee should recommend to the selected institutions that the membership of the local committee include (a) a physician well versed in the physiology and pathology of the blood forming organs; (b) a physician well versed in metabolism and metabolic disorders; (c) a competent biophysicist, radiologist, or radiation physiologist qualified in the techniques of radioisotopes.

These recommendations, if carried out, would have the following advantages:

(1) The Interim Advisory Committee would at once circumscribe the distribution of radioactive isotopes to well-qualified institutions.

(2) The local institutional committee would accomplish the following: (a) reduce the correspondence to one individual per institution. This would facilitate intelligent application requests; (b) facilitate the institution's contractual relationship with the District; (c) in case of a limited supply of any particular isotope, it would allow the institution to apply its own priorities.

(3) It would insure a more judicious and safe use of available material.

(4) The efforts of the Sub-Committee on Human Applications would be more economically expended and the responsibility for an equitable local distribution would be shared by the hospital, medical school, or clinic involved."

/S/ Andrew H. Dowdy,
Andrew H. Dowdy, M.D., Chairman.

The institutional survey and the adoption of the above recommendations will enable a system of allocation to be adopted as follows:

(1) Institutions will then be selected by the Sub-Committee on Human Applications as qualified to undertake therapeutic and diagnostic investigations with each of the following isotopes:

- a. I 131
- b. P 32
- c. Sr 89,90
- d. Na 24

These are not mutually exclusive; some institutions may qualify on all four.

(2) The total actual demand for each of these isotopes will then be made known to the Clinton Laboratory authorities who will decide what level of production they may be able to maintain on each. In case the demands for all four cannot be met, the relative weight to be assigned to each isotope for therapeutic and diagnostic purposes will be recommended by the Sub-Committee on Human Applications to the main Committee for final decision. It is assumed that insofar as feasible Clinton Laboratories will align the relative production with regard to the assigned weighted values.

(3) If, on the basis of 2 above, the production level of an isotope will not satisfy the actual demands of all the selected institutions, the Sub-Committee on Human Applications will make a priority selection or rating among the groups qualified for each isotope, such that the demands of the highest priority group can be met. Each institution of the first priority group will be made an allocation of up to a certain limit per period (week, month, etc., depending on isotope), insofar as general

commitments can be made by Clinton Laboratories for such a supply. The second priority group will receive material on an irregular allocation basis, when and if available above the amounts actually ordered by the top priority group from its allotment.

(4) Institutions newly requesting will be passed upon by the Sub-Committee on Human Applications for each isotope they wish to use. Once approved for the use of an isotope, the institution can receive this isotope regularly insofar as the supply and allocation will permit, provided the local "isotope committee" is maintained.

(5). The local "isotope committee" at the institution will decide upon the allocation of the received material for various clinical investigations at the institution. The Sub-Committee on Human Applications will not therefore have to decide priorities on individual cases and uses. Once the overall allocation is made to the institution the local isotope committee governs the applications.

(6) The material is not to be distributed by the institution to secondary users outside the direct observation of the institution; (i.e., not to private doctors outside the staff of the institution or to other institutions unless passed upon by the Sub-Committee on Human Applications as qualified to use the particular isotope).

(7) If the pool of an isotope obtained for anticipated therapeutic and diagnostic needs is not being used up as expected and is in danger of loss by decay, safe amounts of the isotope can be allocated by the local isotope committee for tracer investigations within the institution, or the Secretary of the Sub-Committee on Allocation can give approval for transfer of the material to another institution, provided all users are covered by a properly negotiated "Agreement for Order and Receipt of Radioactive Materials".

b. Allocation on Temporary Irregular Basis.

Until the recommended overall survey is made concerning a regular allocation to qualified institutions, it was considered highly desirable by the sub-committee in the meantime to use whatever materials become available for allocations on a temporary basis (no commitment on routine rate of supply).

Permission to allocate I 131 was approved, without commitment regarding a regular rate of supply until completion of the institutional survey, to the following clinical institutions:

- (1) University of California Medical School and Hospital
- (2) University of Chicago Medical School, Billings Hospital
- (3) University of Columbia Medical School, Presbyterian Hospital
- (4) Evans Memorial Hospital, Boston, Mass.
- (5) Harper Hospital, Detroit, Mich.
- (6) Memorial Hospital, New York, N.Y.
- (7) Montefiore Hospital, New York, N.Y.
- (8) Massachusetts General Hospital, Boston, Mass.
- (9) University of Rochester Medical School, Strong Memorial Hospital

- (10) Vanderbilt University Medical School
- (11) Washington University Medical School, St. Louis, Mo.
- (12) Western Reserve University Medical School, Lakeside Hospital.

The Secretary of the Sub-Committee on Allocation was given authority by the Sub-Committee on Human Applications to allocate I 131 to the above approved institutions for the use of the persons at these institutions who are recognized for their experience with human applications of radioisotopes.

Pending the overall survey and the availability of extracted P 32, no action was taken on a list of approved institutions for P 32 clinical use. Institutions will probably not wish to change from the present cyclotron supply (which most are dependent upon), until there is some hope of obtaining a regular supply in a form which requires little processing by the institution.

No action was taken regarding other isotopes; allocation will be approved by the Sub-Committee on Human Applications by isotope and by institution as the demand arises.

Also on a temporary basis it was recommended that of the therapeutically used isotopes up to 20% of available material be reserved for tracer applications (if there is a demand for such). If over 20% of the available stock is being requested for tracer purposes, a policy decision will be obtained from the main committee.

5. Allocation of Available Materials by Intended Use.

a. Priority by Intended Use.

As a guide for allocation in case of conflicting demands for I 131, the priority for intended use was approved as follows:

- First: A carcinoma that has been demonstrated to take up iodine.
- Second: Grave's disease or exophthalmic goiter.
- Third: Benign adenomata of the thyroid.

The following order of priority for intended use of P 32 was considered logical, but not formally approved:

- First: Polycythemia Vera
- Second: Chronic myelogenous leukemia
- Third: Chronic lymphatic leukemia
- Fourth: Others (except no allocation while P 32 scarce for surface beta ray irradiation, i.e., superficial lesions.)

After an institution has a local "isotope committee" and is regularly receiving material, the priority of use by the institution will be determined by this local committee.

b. Specific Uses for Certain Isotopes.

In addition to the highest priority uses listed in "a", the advisability of some other human applications of isotopes was discussed.

P 32. Allocation of P 32 for the treatment of superficial lesions was vetoed until production for this purpose would not reduce the supply of all isotopes for fundamental researches or for the higher priority clinical applications. This action was based on the successful treatment of such lesions with readily available X-ray equipment. Should a local beta ray application be shown to be more convenient or more suitable for the treatment of some lesions, the question was raised whether (1) lower specific activity (n, gamma) material could be used and (2) another more available beta emitter could be substituted for P 32.

C-14. The opinion was generally expressed that, even though the scarcity of C 14 is a major factor to be considered, the use of this material in a human being should not be sanctioned until its absorption and elimination properties is clearly demonstrated in animals. The very long half-life of the material makes caution desirable.

Au 199. The use of colloidal radiogold has been proposed for the treatment of leukemias and for tracer studies in arthritis. Here again a human application should be based on proper studies of this material in animals.

Sr 89, 90. Since this deposits to a great extent in the bones and has been shown readily to produce bone sarcomas in mice with a clinical picture like that of radium poisoning, much care should be exercised in the human use of this material. In particular, the Sr 90 (and Y 90 daughter) should not contribute in excess of 1% to the total rate of beta disintegration. Experience in the effects of long half-life beta emitters in animals and human is essential for the safe use of this material.

UX 1, UX 2. This naturally radioactive pair behaves chemically as UX 1, a thorium isotope (Th 234). Proposals have been made to extract the UX 1, UX 2 from uranium and investigate its possible therapeutic usefulness. Aside from the danger of bone damage, the material would have to be used with much caution because of likely kidney damage. No advantage could be seen in the use of radiothorium over the use of certain other beta ray emitting radioisotopes which deposit in bone. The Manhattan Project might be able to make the material available for investigations in animals provided there were a sufficient demand.

Co 60. As pointed out previously, this might be useful as a substitute for radium gamma ray sources, particular in therapeutically-used needles and packs. This use would not constitute an unique form of treatment. Radium and X-ray equipment are considered to be sufficiently available and satisfactory for those therapeutic uses in which Co 60 might be substituted. If radioisotope production capacity becomes sufficiently great, the use of Co 60 as a substitute for radium might be encouraged and become very important.

6. Mechanism for Handling Requests.

Two copies of each request for material for human application will go to each member of the sub-committee. One copy will be returned from each member to the Isotopes Branch with a "yes" or "no" vote on whether the institution and investigator should use the requested isotope in a human being. The other copy may be retained for possible future reference. If there is a "no" vote from any one member, the request will not be approved. A "yes" vote does not need to have any accompanying remarks, unless required as in cases of assigning a priority to a therapeutic application or to a clinical institution. A "yes" vote on a tracer request may be accompanied, at the option of the member, by an opinion on the proposed investigation and on the ability of the investigator. This will not be essential, however, since human tracer requests will generally classify under fundamental science and will be graded by the Allocation Sub-Committee.

A "no" vote should be accompanied by brief reasons for the "no". If the Isotopes Branch discovers only one "no" on a request and a possibly misunderstood reason for the "no", an attempt will be made to resolve the situation. In cases of more than one "no" vote, no further reference is necessary.

Requests concerning therapeutic and diagnostic applications will be handled as discussed in main Item 4 (parts "a" and "b"). Upon return from the sub-committee, the Isotopes Branch can act for the Allocation Sub-Committee in making an allocation. No referral to the Allocation Sub-Committee is necessary unless a conflict develops with needs for the same isotope in filling allocations for fundamental scientific investigations.

Requests for human tracer experiments, if not vetoed, will be referred to the Allocation Sub-Committee for priority rating. Such requests are the only ones requiring the action of both sub-committees.

In general, there is more of a need for speed in handling requests for human applications than for others because: (1) therapeutic action may be needed urgently, (2) the case may be an exceptionally good one for some purpose and may only be available for study immediately (for example, the chance to obtain tracer samples resulting from a special operation). Consequently, the action on these requests should be confined by each sub-committee member (both sub-committees in some cases) to only a few days, if possible. If not acted upon within a week, the member's secretary should be informed to return a copy of the request to the Isotopes Branch with a note that the member was unable to vote on the request. Action will then be taken upon the basis of the voting members.

SUMMARY:

1. All requests for material for human application must be passed upon by the Sub-Committee on Human Applications before allocation can be effected. This Sub-Committee will veto requests in case:

a. The requestors are not sufficiently qualified to guarantee a safe and trustworthy investigation.

b. Insufficient knowledge exists to permit a safe application of the material in the proposed human cases.

2. Requests for tracer experiments in human beings, which are not vetoed, will be referred to the Sub-Committee on Allocation to be given a priority rating in competition with other scientific investigations. Although only a "yes" or "no" vote is required on such requests by the members of the Sub-Committee on Human Applications, their remarks on the merits of the request will be welcomed.

3. Requests for therapeutic and diagnostic applications will be handled entirely by the Sub-Committee on Human Applications, without subsequent reference to the other sub-committee. The Isotopes Branch will coordinate the balancing of allocation for therapeutic and diagnostic purposes with that for other demands by referral of conflicts to the Allocation Sub-Committee or to the main Distribution Policy Committee.

4. Recommendations adopted by the Sub-Committee for the Allocation of isotopes for human use are, as follows:

a. The sub-committee will initially select a group of medical schools, hospitals, and clinics who may be eligible to receive radioactive isotopes (see appended list).

b. Each initially selected, or later requesting, hospital, medical school, and clinic should be invited to appoint a local committee composed of a chairman and whatever number of members they should see fit to pass upon all isotope requests originating from their institution.

c. All isotope requests from the institution would be initiated by the local chairman or his designated alternate.

d. The membership of the local committee should include at least (1) a physician well-versed in the physiology and pathology of the blood-forming organs, (2) a physician well-versed in metabolism and metabolic disorders, and (3) a competent biophysicist, radiologist, or radiation physiologist qualified in the techniques of radioisotopes.

5. No allocations of isotopes routinely used therapeutically and diagnostically (P 32, I 131, Na 24) will be made on the basis of a regular supply (number of mc per week or month) until:

a. Clinton Laboratories can establish its level of production (production methods are still under development; a routine operations staff is being accumulated; special circumstances may alter production; the Clinton pile and facilities are primarily for research and the isotope capacity is subject to the research program).

b. A survey is made of the institutions on the appended list concerning their qualification under 4 and their actual isotope demands. (Previous surveys were not complete and not based on economic and actual use factors.)

6. Pending the survey (5,b) allocations will only be made as material is available without commitment as to regularity of supply.

7. Each institution, qualified as in 4, will be passed upon for each isotope it desires to use. Once the institution is approved for the use of a certain isotope under the guidance of the local isotope committee, it can continue to receive available allotments of the isotopes for which approved, provided the local committee is maintained.

8. Allotments on a routine basis (when the desired materials become routinely available) will be apportioned by the Sub-Committee on Human Applications among the approved institutions. Up to a maximum amount per unit period (week, month, etc.) will be allocated to each approved institution. (The routine regular receipt of material under the allotment cannot be guaranteed, since special circumstances and the research program of the supplier, Clinton Laboratories, may alter production.)

9. In case the production level will not routinely supply the legitimate demands of all the approved institutions, a priority system will have to be set up by the Sub-Committee on Human Applications on the basis of the type and number of treatments undertaken and the facilities of the institution. First priority institutions may receive regular allotments. Second priority institutions may receive allotments when material is available above the first groups allocation.

10. Allotted radioisotopes are not to be distributed by the institution to secondary users outside the direct guidance of the local isotope committee (which under the Federal Food and Drug Administration Regulations covering "new drugs", will be the responsible, qualified group directing the use of the material). Approval may be obtained for a common allotment to or for transfer of materials between approved institutions.

11. Since the allotment of an isotope for therapy or diagnosis may not always be totally consumed for the allotted use, the local isotope committee may dispense safe amounts of unneeded material for investigations in other than human beings, provided the recipients are connected with the institution (or a cooperating institution) and are specifically named in the officially documented "Agreement for Order and Receipt of Radioactive Materials".

12. To expedite the handling of requests for therapeutic and diagnostic applications on a temporary basis, so that available isotopes will not be wasted and sudden demands can be fulfilled, the Isotopes Branch was given authority to allocate I 131 to a list of institutions approved by the sub-committee, provided the material was allotted for the use of the known radioisotope group at the institution. To resolve conflicts, a priority order was also provided for uses of the isotope. A similar arrangement can be made for P 32 when it becomes routinely available in extracted form.

Paul C. Aebersold

PAUL C. AEBERSOLD, Secretary,
Interim Advisory Committee on
Isotope Distribution Policy.
11 July 1946

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List of Institutions which may be Immediately Interested in and Qualified for
Clinical Investigations with Induced Radioactive Isotopes.

(NOTE: This list may not be complete. Omission from it does not necessarily mean lack of qualifications for the use of radioisotopes. The listed institutions either are carrying on a program or have expressed a desire to initiate a program for the proper clinical use of radioisotopes.)

California Medical School, University of; San Francisco, California

California Radiation Laboratory, University of; Berkeley, California

Chicago Medical School, University of; Chicago, Illinois
Billings Hospital, Chicago

Children's Hospital, Boston, Massachusetts

Cleveland Clinic, Cleveland, Ohio

Columbia Medical School, University of; New York, N. Y.
Presbyterian Hospital, New York

Cornell Medical School, University of; New York, New York

Duke University School of Medicine, Durham, N. C.

Emory University Medical School, Atlanta, Georgia

Harper Hospital, Detroit, Michigan

Harvard University Medical School, Boston, Massachusetts

Illinois Medical School, University of; Chicago, Illinois

Iowa Medical College, University of; Iowa City, Iowa

Jefferson Medical College and Hospital, Philadelphia, Pennsylvania

Loyola University School of Medicine, Chicago, Illinois

Massachusetts General Hospital, Boston, Massachusetts

Massachusetts Memorial Hospitals, Boston, Massachusetts
Evans Memorial Hospital, Boston, Massachusetts

Mayo Clinic, Rochester, Minnesota

Memorial Hospital, New York, N. Y.

Michigan Medical School and Hospital, University of; Ann Arbor, Michigan

Minnesota Medical School, University of; Minneapolis, Minnesota

Montefiore Hospital, New York, N. Y.

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New England Deaconess Hospital, Boston, Massachusetts
Northwestern University Medical School, Chicago, Illinois
Ohio State University Medical School, Columbus, Ohio
Pennsylvania Medical School, University of; Philadelphia, Pennsylvania
Presbyterian Hospital, Philadelphia, Pennsylvania
Rochester Medical School, University of; Rochester, New York
Swedish Hospital, Seattle, Washington
Temple University Medical School, Philadelphia, Pennsylvania
Tennessee Medical School, University of; Memphis, Tennessee
Texas Medical School, University of; Galveston, Texas
Tulane University Medical School, New Orleans, Louisiana
Vanderbilt University Medical School, Nashville, Tennessee
Wake Forest College, Winston Salem, N. C.
Bowman Gray School of Medicine
Washington University Medical School, St. Louis, Missouri
Barnard Free Skin and Cancer Hospital
Barnes Hospital
Western Reserve University Medical School, Cleveland, Ohio
Lakeside Hospital
Yale University Medical School, New Haven, Connecticut

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ADVISORY SUB-COMMITTEE ON ALLOCATION AND DISTRIBUTION

of the

INTERIM ADVISORY COMMITTEE ON ISOTOPE DISTRIBUTION POLICY

Minutes of Initial Meeting - Held June 18, 1946; Chicago, Illinois

Members present: K. T. Bainbridge, Chairman
J. W. Kennedy
J. G. Hamilton
P. C. Aebersold, Secretary

Others present: W. E. Cohn, Consultant on Clinton Laboratories Production
R. S. Stone, Consultant on Medical Applications of Radioisotopes.

Main Items Discussed:

1. Priority of Production Effort
2. Priority of Allocation of Available Materials
3. Mechanism for Handling Requests
4. Relation with Sub-Committee on Human Applications
5. Sub-Committee Business

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1. Priority of Production Effort

In balancing radioisotope production against demand consideration must be given to the great range of perishability of the products. If production is started only after formal demands are known, there will be a lag in fulfilling demands which will be different for different isotopes, depending largely on the half-life of the isotope. For some of the very long half-life isotopes the lag between supply and demand could be many months. Fortunately very long half-life isotopes can be economically stock-piled in anticipation of demand and future production can be governed by the actual rate of new demand. Initially, however, estimates of the relative amounts of various isotopes which should be produced may be in error and it may require some time to balance the relative amounts produced against the relative demands.

Although the lag between supply and demand may be short for short half-life isotopes, it would be desirable to avoid as much lag as possible by keeping a certain production level going continuously on the most demanded isotopes. Changes in production level can be kept more closely abreast of demand in the case of the short half-life isotopes, but if at anytime there is an over-production, a material loss will ensue.

The problem of the relative production effort to be placed on various isotopes (production priority) will be a continuous problem only if the overall

production capacity (irradiation plus chemical processing) is not equal to overall demand. Although it has been anticipated that the overall legitimate national demands for radioisotopes will exceed the immediately available Manhattan Project production facilities, no valid predictions have been possible of the degree of imbalance, particularly for individual isotopes. Actual demands will depend somewhat on the prices, which only recently have been established. It may well be that a lack of qualified manpower and proper equipment rather than of production may prove to be the limitation in the near future in realizing fully the possible applications of radioisotopes.

If the overall production does not meet the overall demand, priorities of production effort or limits of production will have to be established for individual isotopes or for groups of isotopes. The limits of production, hence availability, for each isotope will affect the priorities of allocation for certain uses of the isotope. Conversely, it should be possible, by assigning priorities of allocation for certain uses and by anticipating the amounts of each isotope that may be demanded for various types of uses (which will be gained only after several months initial experience with requests), to estimate fairly well the amounts of each isotope to produce to be able to meet demands with certain priority ratings. As priority ratings for various types of uses of an isotope are changed, the relative production effort placed on that isotope might change.

Since only experience in meeting the actual demand will disclose the adequacies or inadequacies of production, it was not considered profitable as yet to discuss at length a proper apportionment of production effort.

Dr. Hamilton presented for preliminary consideration, however, his estimate of a fair apportionment of production effort between the various isotopes. (When production effort is used to mean irradiation plus chemical processing effort, it can be best gauged by the dollars of production cost as indicated on the isotope price list). Dr. Hamilton's estimate, which is based on an appreciation for the overall immediately possible usefulness for each isotope in all fields of application, is as follows:

Suggested apportionment of production effort by isotopes

C 14	30%
P 32	15%
S 35	10%
Fe 59	10%
H 3	10%
Ca 45	5%
Cl 36	5%
Others	15%

It was not specified whether I 131 was included among "others" or whether it was considered to be recoverable as a fission by-product without much effort in processing. It was also not clear whether the 15% for P 32 would attempt to handle the national therapeutic demand for this isotope.

Conclusions on Discussion Item 1

It was decided (1) that the present general, but still incomplete, production preparations of Clinton Laboratories will be a good starting basis for "testing the market," and (2) that, as the Allocation Sub-Committee and the Clinton Laboratories discover continuing conflicts between demands and production, the conflicts will be brought to the attention of the main Advisory Committee on Distribution Policy in order to obtain a policy decision on relative production effort. The Secretary to the Committee will endeavor to keep abreast of the relation of available production capacity and demand so that policies on production priorities can be referred for Committee decision as they arise.

2. Priority of Allocation of Available Materials

It was pointed out by Dr. Aebersold that (1) the order of priority by main types of use (fundamental science, education, applied science, etc.), as set by the Policy Committee and as stated in the June 14 Science article, did not provide (a) a basis for assigning priorities within each useage group, (b) the relative weight of priority between the listed useage groups (for example, how to rate an excellent application in applied science against a poor one in fundamental science); (2) since the Allocation Sub-Committee could not act in a body on each request, it would be highly desirable to adopt some uniform grading system so that independent judgements could be more or less on the same basis; (3) by grading each request numerically, if possible, extensive correspondence could be avoided by Sub-Committee members in evaluating requests and the Isotopes Branch could fill requests in numerical sequence.

Considerable discussion was held on the basis of assigning priorities of allocation and on schemes for numerically grading priorities.

Dr. Hamilton suggested an apportionment of production effort between the broad useage groups as follows:

Suggested Apportionment of Isotope Production Effort

- 1. Publishable Fundamental Research -----50%

This would be further apportioned between fields as follows:

Physics	15%
Chemistry	25%
Biology	40%
Medicine	20%

- 2. Therapy -----10%

- 3. Educational and Training ----- 5%

- 4. Publishable Applied Research ----- 25%

- 5. Commercial and Others ----- 10%

It was pointed out that the listed percentages do not follow the order of priorities given by the Policy Committee. The argument was advanced that, since these relate to production effort, they take into account the larger amounts of materials needed for some of the types of use. These percentages would not be of help in assigning a priority grade to individual requests, but might be useful in apportioning the overall production effort for all isotopes. They would not hold for any individual isotope, inasmuch as some isotopes find their greatest possible usefulness in therapy and biology while others would have practically no usefulness in these fields.

Dr. Hamilton also suggested a rating system of setting priorities for individual requests within a usage group as follows:

Suggested Individual Request Rating Method

On each item the application could receive up to the listed %.

A. Ability of investigator	25%
B. Significance of problem	20%
C. Experience with radioisotopes	10%
D. Experience of investigator in field of problem	5%
E. Facilities	10%
F. Economy in amount of material requested	20%
G. Material returnable in useable form	10%

It was pointed out that there was duplication in items A and D, and F and G. This rating method would also not give much of a spread between most of the requests, which so far appear on an informal basis to be mostly from qualified persons for good investigations.

Dr. Aebersold, in the interests of obtaining a uniform grading of requests by the separated members of the Sub-Committee, suggested a system which would attempt to break down into detail all the items on which a request might be graded and to assign definite points for each item. For example, the following items might be assigned points:

A. Evaluation of the Investigation or Problem

1. Originality of Expected Results

- (a) Never before investigated by any method
- (b) Results by other methods or investigators questionable
- (c) Results by others have given answers which appear to be good
- (d) Repetition of other work on which answers have been demonstrated to be good

2. Chance of Successful Results
3. Usefulness of Expected Results
 - (a) In furthering the field of investigation
 - (b) To workers in other fields
 - (c) In practical applications

B. Facilities

1. Suitableness of the radioactivity measuring equipment for the investigation
2. Adequacy of Health-Safety equipment and procedures
3. Adequacy of the general research facilities for the investigation

C. Ability of Investigators and Staff

1. Experience and recognition in scientific investigations
2. Experience and recognition in the use of radioisotopes
3. Guidance by qualified interested party in the use of the isotope requested

D. Economy in Use of the Isotope

1. The investigation cannot be satisfactorily done with less material
2. Relative fraction that the requested amount is of the total amount readily available
3. If useable material is recoverable, this will be done and re-used

E. Relative Rating According to Broad Fields of Useage

(Order would be as given by Policy Committee, but relative weights would be assigned)

The above items would be assigned numbers according to importance and the total score obtained by addition, except for item E which would be a weighting factor (multiplication).

As an example of how a spread in the rating on individual items might be obtained, the following rating scale was given:

Rating Scale

- | | |
|-------------------------|--|
| 10 points - Outstanding | (few, if any, would rate better; hardly anything lacking) |
| 8 points - Excellent | (less than outstanding, but very good. Only things lacking are possessed by few.) |
| 6 points - Good | (nothing essential lacking; no question but what careful work will be done by competent staff with appropriate equipment.) |

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Rating Scale (Continued)

- 4 points - Fair (questionable only in a few aspects; not up to the expected good average.)
- 2 points - Poor (lacking in many essential aspects or qualities.)
- 0 points - Unimportant (completely or almost completely lacking in essential aspects or quantities)

Drs. Bainbridge and Kennedy did not consider it feasible to grade requests on such a detailed itemized basis as suggested by Aebersold. They felt that, although many of the items listed would no doubt enter into the grading, (1) there would be other items, not easily expressed on paper, which would enter into the judgement of the reviewer as the result of his overall research experiences; (2) the assignment of points to each item would be difficult and might vary for different isotopes and applications; and (3) there would be considerable overlapping of values, hence judgement, between the various detailed items.

It was finally suggested that the merits of the request be judged on the overall picture of the two broad aspects:

1. The proposed investigation or problem
2. The overall facilities (equipment, staff, ability, etc.)

These two aspects could be judged separately, each on a scale of 0-10.

In addition to the merits of the request itself, there would need to be a scoring factor on two other items: (1) relation of amount of material requested to amounts that can readily be made available and (2) a weighting factor for the broad fields of useage. Dr. Kennedy suggested that multiplication of the score on all four factors would (1) result in a wider spread in the final overall scores, and (2) weight the overall score proportionately to each factor (a zero, for example, on one item would make the total score zero, which would be appropriate).

Dr. Kennedy suggested that the score for amount of material requested be given by

$$\frac{P \text{ (amount stated in Science article as available)}}{R \text{ (amount requested)}}$$

Thus; for example, P equals 1 mc for C 14 and a request for over 1 mc would be highly penalized at present. If it is determined that sufficient material is available to permit the raising of P to say 2 or more, then requests for such amounts would not be penalized. However, a request for an amount less than P will always receive a higher priority, other things being equal. (Actually P is a constant factor in all requests for a given isotope, hence its value does not change relative priorities for this particular isotope).

It is to be noted that if R is very small compared with P a very high total score can be obtained even if other factors are low. This was not considered serious for the following reasons: (1) If a score of zero is obtained on

either item of merit of the request itself (i.e., unimportant problem or inadequate facilities), the total score will still be zero; (2) if R is very small, many requests of this amount could be fulfilled without affecting appreciably the amount available; (3) R will probably not be very small because of the \$25 basic handling fee per request. (This avoids loss of effort by the handling, packaging, and distribution of numerous very small requests).

The linear relation P/R imposes a fairly severe penalty with increasing values of R. It was suggested that this would be satisfactory until more experience is gained. The relation can be made less dependent on R as the need is demonstrated. Instances of outstanding merit in which a large R is necessary could be referred to the Policy Committee for special dispensation.

The weighting factors for the broad fields of useage were recommended set on an initial basis as follows:

1. Publishable fundamental sciences	10
2. Educational and training purposes	3
3. Publishable applied science	2
4. All others, except routine commercial	1
5. Commercial	0

It is to be noted that it is not necessary here to take into account the differentiation between those uses which require small and those which require large amounts, as called for in the priority order of the Science article. Such differentiation is taken into account by the above P/R factor.

It is also to be noted that human therapeutic and diagnostic applications are not listed, for these will be graded on a different basis. Only certain radioisotopes are in demand for therapeutic and diagnostic applications and it is intended to allot, when the overall demands are known, up to a certain production limit for these demands. The amounts allotted for therapy would then be fairly divided among a selected group of properly distributed and qualified clinical groups. Requests for therapeutic use would thus be made to fall first within a certain overall allotment and second within the share routinely apportioned to certain clinics. New clinical groups could be added as production permitted.

Priority for the allocation of radioisotopes to individual clinics could also be governed on the basis of the known value of the requested isotope for the types of cases to be treated. Tracer experiments in humans for other than diagnostic purposes would come under fundamental science and requests for this purpose could be graded on the same basis as other requests.

Conclusion to Discussion Item 2:

Requests for radioisotopes for purposes other than for therapy and diagnosis in humans will be given a priority rating according to the following scoring system:

1. Problem: 0 to 10
2. Facilities: 0 to 10
3. Quantity: P/R

Where P is the amount listed in the Science article as being made available and R is the amount requested

4. Class:
 - a. Fundamental science 10
 - b. Educational 3
 - c. Applied science 2
 - d. Others not commercial 1
 - e. Commercial 0

The total score will be obtained by multiplying the four individual scores. Material will be allocated in the order of the highest scores. The detailed items that enter into the scores of 1 and 2 are to be determined by the Sub-Committee member. Many of the items that entered into the above discussion will no doubt enter into these scores but their contribution to the total will be at the discretion of the member. A continuous exchange of scored requests will enable members to compare scoring and become more uniform in their treatment. The score on 3 is fixed by P and R, hence can be determined by the Isotopes Branch. The score on 4 will only be troublesome in deciding between "fundamental" and "applied" science. A clear cut definition is needed here (it is hoped someone will volunteer this information).

3. Mechanism for Handling Requests

Since Sub-Committee members already have their time quite fully taken up with other matters, they cannot be expected to spend much time processing requests. Basing its functions on this premise, the Isotopes Branch has planned to do as much as possible to reduce the work required of the advisory groups, as follows:

1. Engage in sufficient correspondence with requestors to:
 - a. Be sure that they understand the conditions for obtaining optimum chances for the desired material.
 - b. Obtain all necessary information to insure a satisfactory consideration of their request.
2. Institute a review in the Isotopes Branch into:
 - a. Satisfactoriness of health-safety precautions by users.
 - b. Adequacy of radioisotope measurement facilities - instruments and personnel.

- c. General scientific qualifications as well as radioisotope experience of requestors.
3. Refer requests to the Technical Review Board at Oak Ridge for:
 - a. Feasibility of fulfilling the request as to quality, quantity, and form of isotope requested.
 - b. Time schedule on shipping after allocation is made.
 - c. Consideration of any questions raised by the preliminary review, such as on:
 - (1) Health-Safety.
 - (2) Measurement techniques.
 - (3) Processing of supplied material to desired form.
 - (4) Proper use of the isotope.
 - (5) Personal knowledge, if any, of requestor's ability and significance of his proposed investigation.
 - d. Determining whether the investigation is known to have been done previously, on or off the Project. If done on the Project and the work is declassifiable, requestor may be so notified and, if possible, also informed of the results. This is not meant to discourage or to preclude his repeating the work if he so desires.
4. Refer questionable requests to one or more members of a Panel of Consultants who are experts in the field of the proposed application of the isotope. If neither the Isotopes Branch nor the Technical Review Board can determine sufficient information concerning the significance of the problem and the adequacy of staff and equipment to permit a fair decision on allocation, it will be assumed that the Allocation Sub-Committee members would on the average also need further information. The request will in such case be referred to a Consultant before sending it to the Allocation Sub-Committee.
5. Send all pertinent information, and possibly recommendations, accumulated as a result of the four previously listed procedures along with the request to the Sub-Committee members for determination of the actual priority score.

The plan, which it is hoped can be carried out in practice, will be to furnish the allocation advisor all the information with each request that he will need to make an intelligent evaluation of the request. He, however, will set the final score on each request.

Discussion was held concerning the formation of the Panels of Consultants. The question was raised as to the advisability of each Allocation Sub-Committee member's having a local panel of consultants at his own university.

Although the local institution consultant arrangement has much merit, there were two objections: (1) Wide geographical and institutional distribution of Consultants has been considered highly desirable for fair representation, as well as for the possibility of obtaining advice from persons near to or more familiar with the requestor; (2) The routing of requests to local consultants and the discussion of requests with them would put a considerable burden of handling and follow-up on the Sub-Committee member.

It was further pointed out that the Panels of Consultants should be formally appointed. Requestors should not be in the position of having their proposed researches and applications, which are elucidated in requests, discussed with anyone whom the Sub-Committee members or the Isotopes Branch may choose. In filling out the request forms requestors agree to a review of their requests by advisory groups nominated and appointed with the guidance of the National Academy of Sciences. A list of persons well qualified in fields of possible radioisotope usefulness have been furnished by the President of the Academy. The Policy Committee and the Sub-Committees on Allocation and on Human Applications will be asked to choose small (say 5 member) panels from these nominations. The panel members besides serving as consultants can be widely distributed representatives who will be kept informed on isotope availability and on distribution policy.

Another procedure that should help in the screening and grading of requests would be to recommend to the larger institutions that they form a local "isotope committee" to advise on and pass on requests for isotopes originating from that institution. Requests passed on by a qualified local isotope committee should not need much review on items other than the significance of the problem.

Dr. Kennedy suggested that the work of Sub-Committee members could be reduced by having only one member grade each request. He felt, and the others agreed, that (1) their opinions would no doubt be similar on requests that they were all competent to judge; (2) members would be best qualified to evaluate requests somewhat related to their own field of research; (3) comparison of grading, hence uniformity in assigning priority values, could be obtained by having the one member who does the grading of a request send copies of his action to the other members.

Conclusions on Discussion Item 3:

The Isotopes Branch will, before sending a request for an evaluation of allocation priority, attempt to obtain all the information to accompany the request which is necessary to permit the Allocation Sub-Committee members to make intelligent evaluations. This information will be accumulated by:

1. Use of an "isotope committee" at the requesting institution (when possible).
2. Correspondence with the requestor.
3. Review by the Isotopes Branch.
4. Review by the Technical Review Board.

5. Review, if necessary, by Consultants from appointed Panels in special fields of isotope application.

Requests will then be routed and handled as follows:

1. Four copies of each request will be forwarded to the Allocation Sub-Committee member whose field of research appears most closely related to the field of application of the request.
2. The chosen member will evaluate the request, noting the action on all copies, and distribute copies as follows: (a) keep one for a reference file, (b) send one to the Isotopes Branch for action on allocation, (c) send one each to the other Sub-Committee members for their information and reference on uniformity of scoring procedures.
3. In the event that the chosen member deems it advisable for one or both of the other members to also evaluate the request, he may so indicate on all copies and the Isotopes Branch will wait for the total score before taking action on fulfillment of the request.
4. Requests should not take over three weeks to be processed by the Sub-Committee, including the time to and from the Isotopes Branch. This means that a request will not be kept over two weeks by the Sub-Committee member. If evaluation is not accomplished by the member in two weeks, the request will be returned to the Isotopes Branch, where an evaluation will be made on the basis of the best local advice obtainable.
5. Requests will be processed in "batches", so that a number of them can be compared and handled at one time. This facilitates handling, aids scoring, and saves time. Batches will be made up weekly or bi-weekly as determined at the Isotopes Branch.
6. Requests for materials for application in humans will be handled as discussed in the next section.

4. Relation with Sub-Committee on Human Applications.

As originally conceived the Sub-Committee on Human Applications would have the function of screening all requests for material for application in human beings for the purpose of exercising a veto in case (1) the requestors are not sufficiently qualified to do the investigation, or (2) insufficient knowledge exists concerning the dosage and action of the requested isotope to permit a human application. The Sub-Committee on Allocation reaffirmed this function.

The question was then raised of the desirability of extending the function of the Sub-Committee on Human Applications to permit it to determine priorities of allocation on requests for therapeutic and diagnostic applications. It was felt that tracer experiments (not for routine diagnosis or "therapeutic tests") in humans would be classed as "fundamental science" and should be graded for priority by the Allocation Sub-Committee in competition with other requests

for fundamental scientific investigations. On the other hand, it was felt that the assignment of allocation priority for therapeutic and diagnostic applications is a function best undertaken by the Sub-Committee on Human Applications, since allocation for these purposes will be determined largely by: (1) insurance of safe and proper usage, which is already a consideration of this sub-committee; (2) the selection of properly qualified clinical investigation groups, a logical function of this sub-committee.

Conclusions on Discussion Item 4:

1. All requests for material for human application must be passed upon by the Sub-Committee on Human Applications before allocation can be effected. This Sub-Committee will veto requests in case:
 - a. The requestors are not sufficiently qualified to guarantee a safe and trustworthy investigation;
 - b. Insufficient knowledge exists to permit a safe application of the material in the proposed human cases.
2. Requests for tracer (^{not} diagnostic) experiments in human beings, if not vetoed, will then be given a priority scoring by the Sub-Committee on Allocation in competition with requests for other scientific investigations. ("Where a "pool" of, say, radioiodine or radiophosphorus is maintained at a clinic for therapeutic purposes, arrangements can be made for routine performance of tracer experiments with unused and otherwise wasted material).
3. Requests for therapeutic and diagnostic applications will be handled entirely by the Sub-Committee on Human Applications, as will be discussed in the minutes of the meeting of this sub-committee. The Isotopes Branch will coordinate the balancing of allocation for therapeutic and diagnostic purposes against other demands by referral of conflicts to the Allocation Sub-Committee and to the main Distribution Policy Committee.

5. Sub-Committee Business.

The question was raised of obtaining contracts with the Manhattan Project, for those sub-committee members who do not already have such, to take care of expenses of mail, telephone, travel, and possibly some extra secretarial work in connection with sub-committee business. This concerns only Drs. Bainbridge and Kennedy. The Secretary agreed to make such arrangements insofar as possible. (Arrangements, which will no doubt be satisfactory, are now being made by the Administrative Division). In addition, already addressed, government franked envelopes will be supplied for simplifying sub-committee correspondence.

Occasions will occur when it will be necessary for a sub-committee member to obtain a temporary alternate to act for him. The question was raised

whether the sub-committee member or the Chairman of the Distribution Policy Committee should choose the alternate. It was decided that alternates which are to act for only a short period could most conveniently be chosen by the sub-committee member. The alternate could be at the same institution as the member, making it easy to maintain the request files and correspondence of the member. The Secretary will be informed in advance of the choice of alternate and will notify the Chairman of the Distribution Policy Committee of the action. Permanent replacements of sub-committee members would of course be chosen and appointed through the main committee.

Since Dr. Hamilton will be out of the country for the Bikini test during the initial period of allocation, he chose Dr. Waldo Cohn as his alternate. This will permit rapid handling of some of the first allocations and will allow distribution to get underway as soon as formalities have been completed. Copies of the requests and the priority scores which are handled by an alternate will be furnished all the sub-committee members.

To keep sub-committee and main committee members informed of the actual allocation and distribution which results from the action of the two sub-committees a chart will be prepared monthly by the Isotopes Branch which summarizes the status of action on all requests returned from the sub-committees.

It was considered desirable that, insofar as possible, sub-committee members be informed of the available isotope stock, or immediate production capacity, from which each batch of requests can be fulfilled. Since, however, all priority ratings are relative, the scoring should be independent of the stock available. The quantity rating factor P/R and the proportionate allotment by batch periods will take care of adequately conserving or using up, as the case may be, available isotopes. (See appended memo on "Proposed Procedure for Effecting Allotment of Radioisotopes from Rated Requests"). The Secretary will attempt, nevertheless, to keep the advisory allocation groups currently informed of the situation of supply versus demand.

The Secretary was asked to refer the recommendations and conclusions of the Sub-Committee on Allocation to the Chairman of the main committee, Dr. Du Bridge. The material essentially as contained herein was discussed with Dr. Du Bridge on June 21 and was found to meet with his approval. Circulation of these minutes will permit sub-committee or committee members to suggest any alterations to the proposed procedures. If no modifications are suggested, the procedures will initially be as called for in these minutes.

Conclusions on Discussion Item 5:

A means will be obtained to take care of expenses of sub-committee members, other than for personal salary, incurred by the sub-committee work.

Sub-committee members may choose their own temporary alternates when necessary for continuous handling of requests. A need for long period or permanent replacements should be referred to the Chairman of the Distribution Policy Committee.

The Isotopes Branch will keep sub-committee and committee members currently informed, insofar as possible, of the situation of supply versus demand and will furnish a monthly chart showing the status of action on priority rated requests.

SUMMARY

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PAUL C. AEBERSOLD,
Secretary,
July 8, 1946.