

# Pennock Hospital

1009 West Green Street · Hastings, Michigan 49058-1790 · Ph: (616) 945-3451

U.S. Nuclear Regulatory Commission  
Region 3  
799 Roosevelt Road  
Glen Ellyn, IL 60137

Dear Sir:

Applicant *June 24, 1985*  
Check No. *40294*  
Amount *\$120*  
Type of Fee *Kamal*  
Date Check Rec'd *7/3/85*  
Received By *[Signature]*

U.S. N.R.C.  
LIC. FEE MGMT. BRANCH

'85 JUL -3 AM 10:28

RECEIVED

Thank you for your time on the telephone Friday, May 17th, 1985. Your instructions for requesting a license amendment were appreciated.

Pennock Hospital, license #21-18667-01, requests a license amendment to authorize John Engels, M.D. and William Songer, M.D. to use or supervise the use of all materials listed on the Materials License Supplementary sheet, page 2 in the Conditions section of this page, item 12, to permit the use of Iodine-131 for treatment of hyperthyroidism and cardiac dysfunctions. These physicians' privileges should also be included in Group I, II, III, and Xenon-133.

Based on Pennock Hospital's previous satisfactory record of monthly Xenon trap testing and documentation of the results; none of which have ever exceeded 2X background CPM. Pennock Hospital requests an amendment to the commitment made in the application for Materials License dated September 20, 1984 on page 2, section 21 entitled "Procedures and Precautions for Use of Radioactive Gases" (e.g. Xenon-133). Please see the attached detailed information sheet, item 21, page 3, section 7 entitled "Air Concentration of Xenon-133 in an Unrestricted Area". Please refer to the last paragraph on this page. Pennock Hospital respectfully requests deletion of commitment to a weekly Xenon trap test and requests an amendment to permit monthly Xenon trap testing.

Should you permit this requested amendment the second sentence of this paragraph would read "Immediately after the last Xenon-133 lung ventilation procedure each month a polyethylene bag will be placed over the exhaust port of the Xenon trap, and the unit will be operated until the bag is full".

Please find attached the required preceptor statements, a copy of item 21, page 3 with the area of amendment high-lighted and our check for \$120 to cover these requested license amendments.

If I can be of further assistance please feel free to contact me. My phone number is: (616) 945-3451, ext. 407.

Sincerely,

*Michael G. Huver, R.T.*

Michael G. Huver, R.T.  
Radiology Director

RECEIVED

JUN 27 1985

REGION III

MGH:vlh  
Enclosures

8508120254 850725  
REG3 LIC30  
21-18667-01 PDR

JUN 27 1985

CONTROL NO. 7 9238

# PRECEPTOR STATEMENT (Continued)

## 2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN (Continued)

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
P-32 (Soluble)	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA, AND BONE METASTASES		
P-32 (Colloidal)	INTRACAVITARY TREATMENT		
I-131	TREATMENT OF THYROID CARCINOMA	X	
	TREATMENT OF HYPERTHYROIDISM	X 20	
Au-198	INTRACAVITARY TREATMENT		
Co-60 or Cs-137	INTERSTITIAL TREATMENT		
	INTRACAVITARY TREATMENT		
I-125 or Ir-192	INTERSTITIAL TREATMENT		
Co-60 or Cs-137	TELETHERAPY TREATMENT		
Sr-90	TREATMENT OF EYE DISEASE		
	RADIOPHARMACEUTICAL PREPARATION		
Mo-99/ Tc-99m	GENERATOR		
Sn-113/ In-113m	GENERATOR		
Tc-99m	REAGENT KITS		
Other			

### X 3. DATES AND TOTAL NUMBER OF HOURS RECEIVED IN CLINICAL RADIOISOTOPE TRAINING

Jan 1976 - March 1976  
Feb 1978 - April 1978 > greater than 500 hours

### X 4. THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OF:

a. NAME OF SUPERVISOR

John Champion MD

b. NAME OF INSTITUTION

Blodgett Memorial Med. Ctr

c. MAILING ADDRESS

1840 Wealthy St

d. CITY

Grand Rapids, MI 49506

5. MATERIALS LICENSE NUMBER(S)

21-18667-01 + 21-13230-01

X 6. PRECEPTOR'S SIGNATURE

*John P. Champion MD*

7. PRECEPTOR'S NAME (Please type or print)

John Champion

8. DATE

2/18/85

PRECEPTOR STATEMENT

Supplement B must be completed by the applicant physician's preceptor. If more than one preceptor is necessary to document experience, obtain a separate statement from each.

1. APPLICANT PHYSICIAN'S NAME AND ADDRESS	KEY TO COLUMN C
<p>FULL NAME <i>William L. Sanger</i></p> <p>STREET ADDRESS <i>5613 Chief Noonday Rd</i></p> <p>CITY   STATE   ZIP CODE <i>Hastings, Mo 49058</i></p>	<p><b>PERSONAL PARTICIPATION SHOULD CONSIST OF:</b></p> <p>1-Supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation for prescribed dosage.</p> <p>2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data.</p> <p>3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.</p>

2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
I-131 or I-125	DIAGNOSIS OF THYROID FUNCTION		
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME		
	LIVER FUNCTION STUDIES		
	FAT ABSORPTION STUDIES		
	KIDNEY FUNCTION STUDIES		
	IN VITRO STUDIES		
OTHER			
I-125	DETECTION OF THROMBOSIS		
I-131	THYROID IMAGING		
P-32	EYE TUMOR LOCALIZATION		
Se-75	PANCREAS IMAGING		
Yb-169	CISTERNOGRAPHY		
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES		
OTHER			
Tc-99m	BRAIN IMAGING		
	CARDIAC IMAGING		
	THYROID IMAGING		
	SALIVARY GLAND IMAGING		
	BLOOD POOL IMAGING		
	PLACENTA LOCALIZATION		
	LIVER AND SPLEEN IMAGING		
	LUNG IMAGING		
	BONE IMAGING		
OTHER			

# PRECEPTOR STATEMENT (Continued)

## 2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN (Continued)

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P-32 (Colloidal)	INTRACAVITARY TREATMENT		
I-131	TREATMENT OF THYROID CARCINOMA	15	
	TREATMENT OF HYPERTHYROIDISM	22	
Au-198	INTRACAVITARY TREATMENT		
Co-60 or Cs-137	INTERSTITIAL TREATMENT		
	INTRACAVITARY TREATMENT		
I-125 or Ir-192	INTERSTITIAL TREATMENT		
Co-60 or Cs-137	TELETHERAPY TREATMENT		
Sr-90	TREATMENT OF EYE DISEASE		
	RADIOPHARMACEUTICAL PREPARATION		
Mo-99/ Tc-99m	GENERATOR		
Sn-113/ In-113m	GENERATOR		
Tc-99m	REAGENT KITS		
Other			

## 3. DATES AND TOTAL NUMBER OF HOURS RECEIVED IN CLINICAL RADIOISOTOPE TRAINING

AUGUST 1965 - JULY 1968

AUGUST 1968 - JULY 1969

## 4. THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OF:

a. NAME OF SUPERVISOR

JOHN P. CHAMPION, M.D.

b. NAME OF INSTITUTION

BLODGETT MEMORIAL HOSPITAL

c. MAILING ADDRESS

1840 WEALTHY, S.E.

d. CITY

GRAND RAPIDS, MI 49506

5. MATERIALS LICENSE NUMBER(S)

## 6. PRECEPTOR'S SIGNATURE

## 7. PRECEPTOR'S NAME (Please type or print)

JOHN P. CHAMPION, M.D.

## 8. DATE

PRECEPTOR STATEMENT

Supplement B must be completed by the applicant physician's preceptor. If more than one preceptor is necessary to document experience, obtain a separate statement from each.

<b>1. APPLICANT PHYSICIAN'S NAME AND ADDRESS</b> <hr/> <p>FULL NAME JOHN P. ENGELS, M.D.</p> <hr/> <p>STREET ADDRESS 1009 W. GREEN STREET</p> <hr/> <table style="width: 100%;"> <tr> <td style="width: 33%;">CITY HASTINGS</td> <td style="width: 33%;">STATE MI</td> <td style="width: 33%;">ZIP CODE 49058</td> </tr> </table>	CITY HASTINGS	STATE MI	ZIP CODE 49058	<b>KEY TO COLUMN C</b> <b>PERSONAL PARTICIPATION SHOULD CONSIST OF:</b> 1-Supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation for prescribed dosage. 2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data. 3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.
CITY HASTINGS	STATE MI	ZIP CODE 49058		

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I-125	DETECTION OF THROMBOSIS		
I-131	THYROID IMAGING		
P-32	EYE TUMOR LOCALIZATION		
Se-75	PANCREAS IMAGING		
Yb-169	CISTERNOGRAPHY		
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES		
OTHER			
Tc-99m	BRAIN IMAGING		
	CARDIAC IMAGING		
	THYROID IMAGING		
	SALIVARY GLAND IMAGING		
	BLOOD POOL IMAGING		
	PLACENTA LOCALIZATION		
	LIVER AND SPLEEN IMAGING		
	LUNG IMAGING		
	BONE IMAGING		
OTHER			

# INFORMATION REQUIRED FOR ITEMS 7 THROUGH 23

For Items 7 through 23, check the appropriate box(es) and submit a detailed description of all the requested information. Begin each item on a separate sheet. Identify the item number and the date of the application in the lower right corner of each page. If you indicate that an appendix to the medical licensing guide will be followed, do not submit the pages, but specify the revision number and date of the referenced guide: Regulatory Guide 10.8, Rev. 1 Date: Oct. 1980

7. MEDICAL ISOTOPES COMMITTEE		15. GENERAL RULES FOR THE SAFE USE OF RADIOACTIVE MATERIAL (Check One)	
<input checked="" type="checkbox"/>	Names and Specialties Attached; and	<input checked="" type="checkbox"/>	Appendix G Rules Followed; or
<input checked="" type="checkbox"/>	Duties as in Appendix B; or		Equivalent Rules Attached
	(Check One)		
	Equivalent Duties Attached	16. EMERGENCY PROCEDURES (Check One)	
8. TRAINING AND EXPERIENCE		<input checked="" type="checkbox"/>	Appendix H Procedures Followed; or
<input checked="" type="checkbox"/>	Supplements A & B Attached for Each Individual User; and		Equivalent Procedures Attached
<input checked="" type="checkbox"/>	Supplement A Attached for RSO.	17. AREA SURVEY PROCEDURES (Check One)	
9. INSTRUMENTATION (Check One)		<input checked="" type="checkbox"/>	Appendix I Procedures Followed; or
<input checked="" type="checkbox"/>	Appendix C Form Attached; or		Equivalent Procedures Attached
	List by Name and Model Number	18. WASTE DISPOSAL (Check One)	
10. CALIBRATION OF INSTRUMENTS		<input checked="" type="checkbox"/>	Appendix J Form Attached; or
	Appendix D Procedures Followed for Survey Instruments; or		Equivalent Information Attached
<input checked="" type="checkbox"/>	(Check One)	19. THERAPEUTIC USE OF RADIOPHARMACEUTICALS (Check One)	
	Equivalent Procedures Attached; and	<input checked="" type="checkbox"/>	Appendix K Procedures Followed; or
<input checked="" type="checkbox"/>	Appendix D Procedures Followed for Dose Calibrator; or		Equivalent Procedures Attached
	(Check One)		
	Equivalent Procedures Attached		
11. FACILITIES AND EQUIPMENT		20. THERAPEUTIC USE OF SEALED SOURCES	
<input checked="" type="checkbox"/>	Description and Diagram Attached		Detailed Information Attached; and
12. PERSONNEL TRAINING PROGRAM		<input checked="" type="checkbox"/>	Appendix L Procedures Followed; or
<input checked="" type="checkbox"/>	Description of Training Attached		(Check One)
			Equivalent Procedures Attached
13. PROCEDURES FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL		21. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE GASES (e.g., Xenon - 133)	
<input checked="" type="checkbox"/>	Detailed Information Attached	<input checked="" type="checkbox"/>	Detailed Information Attached
14. PROCEDURES FOR SAFELY OPENING PACKAGES CONTAINING RADIOACTIVE MATERIALS (Check One)		22. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL IN ANIMALS	
<input checked="" type="checkbox"/>	Appendix F Procedures Followed; or	N/A	Detailed Information Attached
	Equivalent Procedures Attached	23. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6.b	
		<input checked="" type="checkbox"/>	Detailed Information Attached

- c. For restricted areas to maintain air concentrations less than 0.00001 uCi/ml the required ventilation rate is (assuming a 40-hour work week):

$$(80000 \text{ uCi/wk}) / (0.00001 \text{ uCi/ml}) = 118 \text{ cfm.}$$

Therefore, normal exhaust rates of 1,100 cfm in this area is quite sufficient.

#### 7. Air Concentration of Xe-133 in Unrestricted Areas

The disposal of the Xe-133 gas will be done by trapping the Xe-133 gas in the Pulmonex Xenon System gas trap. Again assuming an escape fraction of 0.2, maximum concentration at the exhaust point is

$$400 \text{ mCi/wk} \times 0.2 = 80000 \text{ uCi/wk}$$

The exhaust point is an unrestricted but unoccupied area on the roof of the Hospital and it is isolated from any unrestricted areas by distances exceeding 50 feet. Assume that the Xe-133 gas is exhausted into a hemi-spherical volume of air in a 50' radius at the exhaust point. The volume would be  $2.6 \times 10^5 \text{ ft}^3$  or  $7.4 \times 10^9 \text{ ml}$ . The concentration at the boundary of this volume after the discharge of 80000 uCi would be

$$(80000 \text{ uCi/wk}) / (7.4 \times 10^9 \text{ ml}) = 1.1 \times 10^{-5} \text{ uCi/ml}$$

Assuming the concentration remains constant for 5 minutes, the average concentration per week would be .

$$(1.1 \times 10^{-5} \text{ uCi/ml} \times 5 \text{ min}) / (10080 \text{ min/wk})$$

$$= 5.5 \times 10^{-9} \text{ uCi/ml}$$

This would be well within  $3 \times 10^{-7} \text{ uCi/ml}$  for unrestricted areas.

To insure that the trap is working efficiently, we will monitor the exhausted air from the trap by the following procedure. Immediately after the last Xe-133 lung ventilation procedure each week, a polyethylene bag will be placed over the exhaust port of the Xenon trap, and the unit will be operated until the bag is full. The bag will be sealed and placed in front of the Gamma Camera and counted for one minute on the appropriate settings. The counts per minute (CPM) will be