



774 Christiana Road
Suite 2
Newark, Delaware 19713

Phone: (302) 738-0300
Fax: (302) 355-0155

Br. 1

October 13, 2009

Michelle R. Simmons
Medical Branch
Division of Nuclear Materials Safety
US Government NRC Commission, Region One
475 Allendale Road
King of Prussia, PA 19406-1431

RECEIVED
REGION 1
2009 OCT 15 PM 12:53

RE: Current RAM license #07-31332-01, Docket or Reference #03037830

Dear Ms. Simmons,

Please amend our license for:

Delaware Outpatient Center for Surgery
774 Christiana Road, Suite 2
Newark, DE 10713

to reflect the use of ADVANTAGE Pd-103 Brachytherapy sources. The model number is: IAPd-103A, Advantage Seed; Manufacturer is IsoAid, LLC (www.isoaid.com). We would like to add the IsoAid ADVANTAGE™ (model IAPd-103A) Pd-103 source to our Radioactive Materials License.

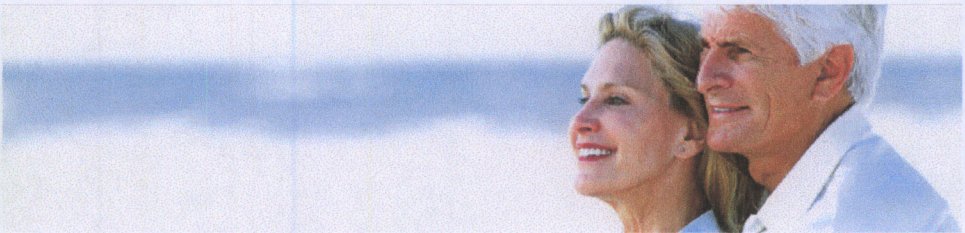
Website for the Advantage Pd-103 Brachytherapy Seed is: <http://www.isoaid.com/Pd103.html>.

If further information is required, please call me at (302) 623-4824.

Sincerely,

Adam Raben, MD
Radiation Oncologist
Authorized User at Delaware Outpatient Center for Surgery

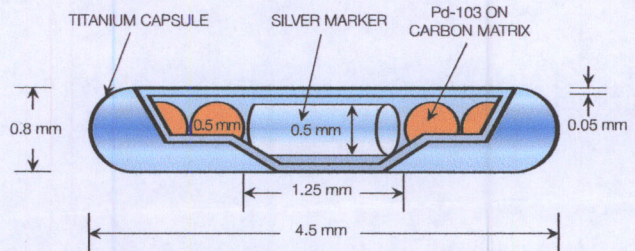
144234
NRC/RCM MATERIALS-002



IsoAid ADVANTAGE™ Pd-103 (IAPd-103A)

Dosimetry Parameters

The dosimetric characteristics of IsoAid ADVANTAGE™ (model IAPd-103A) Pd-103 source have been experimentally and theoretically determined, following the Updated AAPM Task Group 43 (TG43U1) recommendations.^{1, 2}



IsoAid ADVANTAGE™ (model IAPd-103A) Pd-103 source

Monte Carlo simulated dose rate constant in water³

Dose Rate Constant	Λ
0.69 cGy/h/U	

Monte Carlo simulated line source approximation radial dose function³ ($g_L(r)$) and point source approximation radial dose function ($g_P(r)$)

Distance (cm)	Radial Dose Function	
	$g_L(r)$	$g_P(r)$
0.0	1.212	0.997
0.2	1.212	0.997
0.4	1.293	1.228
0.5	1.263	1.225
0.6	1.216	1.194
0.8	1.111	1.104
1.0	1.000	1.000
1.5	0.761	0.766
2.0	0.579	0.584
2.5	0.431	0.435
3.0	0.323	0.326
3.5	0.235	0.237
4.0	0.177	0.179
4.5	0.127	0.128
5.0	0.092	0.093
6.0	0.050	0.051
7.0	0.029	0.029
8.0	0.018	0.018

NOTE: $g(r)$ at 0.0cm equals $g(r_{min})$ as recommended by AAPM Task Group No. 43U1 Report

Monte Carlo simulated anisotropy function in water³

Angle (Degree)	Anisotropy Function $F(r, \theta)$					
	0.5cm	1.0cm	2.0cm	3.0cm	4.0cm	5.0cm
0	0.262	0.296	0.292	0.301	0.308	0.335
10	0.320	0.337	0.331	0.344	0.353	0.380
20	0.503	0.471	0.457	0.471	0.473	0.514
30	0.712	0.642	0.638	0.623	0.634	0.652
40	0.859	0.781	0.774	0.748	0.760	0.787
50	0.942	0.885	0.884	0.852	0.852	0.906
60	0.977	0.951	0.960	0.922	0.936	0.994
70	0.993	0.983	0.991	0.956	0.946	1.027
80	0.999	0.996	1.022	0.976	0.967	0.994
90	1.000	1.000	1.000	1.000	1.000	1.000
$\phi_{an}(r)$	0.94	0.88	0.88	0.84	0.85	0.85

Polynomial Equation

$$g_L(r) = a_0 + a_1r + a_2r^2 + a_3r^3 + a_4r^4 + a_5r^5$$

Where:

$a_0 = 1.3277E+0$	$a_1 = -1.0811E-1$
$a_2 = -2.9365E-1$	$a_3 = 1.1012E-1$
$a_4 = -1.4814E-2$	$a_5 = 6.9124E-4$

References

1. R. Nath, L.L. Anderson, G. Luxton, K.A. Weaver, J.F. Williamson, A.S. Meigooni, "Dosimetry of interstitial brachytherapy sources: Recommendations of the AAPM Radiation Therapy Committee Task Group No. 43," Med. Phys. 22(2) (1995) 209-234.
2. M.J. Rivard, B.M. Coursey, L.A. DeWerd, W.F. Hanson, M.S. Huq, G.S. Ibbott, M.G. Mitch, R. Nath, J.F. Williamson, "Update of AAPM Task Group No. 43 Report: A revised AAPM protocol for brachytherapy dose calculations," Med Phys. 31(3) (2004) 633-674.
3. A.S. Meigooni, S.A. Dini, S.B. Awan, K. Dou, R.A. Koona, "Theoretical and experimental determination of dosimetric characteristics for ADVANTAGE™ Pd-103 Brachytherapy source," Applied Radiation and Isotopes 64(8) (2006) 881-887.

October 13, 2009

To: Dr. Bryan A. Parker
United States Nuclear Regulatory Commission, Region 1
475 Allendale Rd
King of Prussia, Pennsylvania 19406-1415

Licensee: Delaware Outpatient Center for Surgery
License number 07-31332-01
RSO: Adam Raben M.D.

RECEIVED
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Dear Dr. Parker:

I am writing to inform you that the written directive form to order radioactive materials and the inventory record form have both been modified from the ones originally on the NRC license to add additional detail for our program. Attached are copies of the updated forms.

Please acknowledge receipt and approval for these updated forms. We appreciate your continued assistance.

Sincerely,



Adam Raben M.D.
RSO

**ROPA
PROSTATE SEED
BRACHYTHERAPY WRITTEN DIRECTIVE**
 Christiana _____ Union _____ DOC's _____

Patient's Name or Identification Sticker

Clinical Diagnosis and Comments:

PSA:

GLEASON:

T STAGE:

RISK GROUP:

IPSS:

QOL:

PNI:

NAD:

ERT:

Proposed Plan of Treatment (include proposed Loading)

PRE IMPLANT 3D VOLUME:

SEED VENDOR:

SOURCE STRENGTH (mCi):

ADDITIONAL SOURCES: #

INITIAL PREPLAN:

MICK APPLICATOR-LOOSE SEED TECHNIQUE:

ISOLOADER STRAND TECHNIQUE:

17 GUAGE NEEDLES CORE:

18 GUAGE NEEDLES CORE:

18 GUAGE NEEDLES: MICK

Implant date:

CCHS MRN : _____

DOCS ID#: _____

Prescription Point: _____

Prescribed Dose: _____ Gy

External Beam Dose: _____ Gy

Total Dose (Ext + Brachy) _____ Gy

Radioisotope: _____

No. of Sources: _____

Special Treatment Procedure

Special Medical Physics Consult

Physics Chart Check

Physician Signature & Date:

Physics will enter optimized activity & time

Total Activity: _____ mCi

Physicist Signature: _____ Date: _____

Delaware Outpatient Center for Surgery
Receipt of Radioactive Material and Seed Implant log

Survey Instruments: (1). Ludlum Model-14C, S/N: 252075 (2). Victoreen Model-451, SN:3116

Wipe test Counter: Capintec- Model: Caprac, S/N: 2161 Wipe 300 cm² of external surface, test result should be < 6600 dpm

Year:

Date Received	Patient Name	Isotope	Quantity	Activity (mCi /seed)	Survey Meter#	Pkg-survey mR/Hr *	Pkg Wipe test *	Staff initials	Implant date	# of seeds used	# of seeds stored	Staff Initials	Date ship back to vendor	Staff Initials

* The Package-Survey and Wipe-Test are required for Labeled packages(White I, Yellow II and Yellow III) or if the packages are wet, crushed or damaged.

This is to acknowledge the receipt of your letter/application dated 10/13/09 ^(CS) and to inform you that the initial processing which includes an administrative review has been performed.

Amendment (03037830) There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

Please provide to this office within 30 days of your receipt of this card

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 144234.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.