Division of Compensation Analysis and Support Program Evaluation Report	Document Number: DCAS-PER-043 Effective Date: 6/7/2013 Revision No. 0

Internal Dosimetry Organ, External Dosimetry Organ, and IREP Model Selection by ICD-9 Code Revision

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RECORD OF ISSUE/REVISIONS			
ISSUE AUTHORIZATION DATE	**EFFECTIVE DATE**	**REV. NO.**	**DESCRIPTION**
6/7/2013	6/7/2013	0	New document to determine the effect on previously completed claims due to revisions to ORAUT-OTIB-0005.

1.0 Description

Revision 0 of the ORAU Technical Information Bulletin *Internal Dosimetry Organ, External Dosimetry Organ, and IREP Model Selection by ICD-9 Code* (ORAUT-OTIB-0005) was issued on 11/03/2007. Since that time a number of revisions to the document have been issued. The various revisions, along with their issue dates are listed below.

Revision 0	11/3/2003
Revision 1	1/23/2004
Revision 1 PC-1	3/5/2004
Revision 1 PC-2	5/7/2004
Revision 1 PC-3	10/29/2004
Revision 2	12/2/2005
Revision 2 PC-1	2/10/2006
Revision 3	2/26/2010
Revision 4	4/18/2011
Revision 5	12/20/2012

2.0 Issue Evaluation

Revision 1 was issued to incorporate external organ guidance into the document. Prior to that, the guidance was located in OCAS-IG-001. This revision did not constitute a change in dose, only the consolidation and formalization of instructions.

In revision 1 PC-1, besides editorial changes, the Bone cancer model was added as a possible option to ICD-9 code 238.7.

In revision 1 PC-2, the internal organ for codes 231.8, 235.8 and 235.9 was changed from lung to "medical review". These codes encompass organs that could be described by more than one internal dose organ of interest.

Also in this revision, the external organ for the prostate was changed from testes to the bladder. This affects the dose conversion factors (DCF) used to estimate the organ dose. The DCF for the bladder is lower than that of the testes; therefore, this change represents a decrease in assigned dose.

In revision 1 PC-3, the internal dose organ for ICD-9 codes 189.2, 189.3 and 189.4 were changed to the "highest nonmetabolic organ" from kidney, bladder and bladder respectively. The highest nonmetabolic organ by definition receives a lower dose than modeled organs, therefore, this change represents a decrease in dose.

Also in this revision, a footnote was added to ICD-9 code 232. While the table specifies that both malignant melanoma and squamous cell carcinoma cancer models are to be used (and the one producing the highest POC chosen) the footnote clarifies that if the cancer type is specified, only that specific model is to be used. Therefore, this change represents a decrease for some cases.

In revision 2, Codes 289.7 and 289.9 were added. Prior to the revision, claims with this code could not be completed. Since no claims with these codes were completed prior to the revision, this does not represent a change in dose.

Also in this revision, the method by which adenocarcinoma of the distal esophagus (lower third) is handled was changed. The revised method indicates that if the cancer is known to be adenocarcinoma and known to be in the lower third of the esophagus, stomach cancer (both modeled organs and cancer models) is to be considered.

Also in revision 2, the external organ for codes 233.4 and 236.5 were changed from testes to bladder. This represents a decrease in external dose.

Lastly, this revision marked many lymphoma codes as "Reserved" to prevent those cases from being completed. This was a result of a re-evaluation of the appropriate internal dose organs for lymphomas. Approximately two months later, revision 2 PC-1 was issued that provided the appropriate organs for those cancers based on OCAS-TIB-012. The changes to these organs were evaluated separately in OCAS-PER-009 and will not be further evaluated here.

Revision 3 made changes to the organs used for codes 155.1 and 156. The external organs for these codes were changed from bladder to liver. This represents a decrease in

calculated external dose. The internal organ for 155.1 was changed from gallbladder, to liver/gallbladder. A footnote indicates that liver is to be used for intrahepatic ducts, gallbladder for gallbladder and a medical review to determine appropriate organ for any other specific organs.

Revision 4 made changed to the external organs used for codes 194.1 and 194.5. The external organ was changed to thyroid when previously it was thyroid/remainder with a footnote to choose the highest. This change therefore represents either a decrease or no change to the dose of applicable claims.

Revision 4 also changed the cancer model for code 232. Previously, both malignant melanoma and squamous cell carcinoma were to be used (choosing the one that produced the highest probability of causation). Revision 4 added basal cell carcinoma to that list. However a footnote indicates that if the type of cancer is specified, only that type is to be used.

In revision 4, the internal target organ for codes 236.91, 238.2 and 238.3 were changed from "medical review" to a specific organ (kidney, skin and breast respectively). Also for code 238.2, squamous cell carcinoma was added as a possible cancer model. However, the change to the cancer model results in a decrease or no change in probability of causation so it will not be considered further in this PER.

Lastly, revision 4 changed the target organs for codes 238.0 and 239.2. The internal target organ was changed to bone surfaces from "medical review". The external target organ was changed to bone surface from red bone marrow.

Revision 5 added target organs and a cancer model for code 204.1 (chronic lymphocytic leukemia). Previously these were all listed as "NA" with a footnote indicating the cancer was not considered radiogenic by 42 CFR 81.30.

Revision 5 also clarified some issues and removed stomach as an option for codes 150.1 and 150.9 (esophageal cancer). These changes do not represent an increase in dose.

3.0 Plan for Resolution or Corrective Action

Corrective actions were considered only for those changes that could result in an increase in the probability of causation to some claims.

Revision 1 PC-1 was issued on 3/5/2004. Five claims were completed with code 238.7 prior to that date. All five were subsequently returned for other reasons and reworked

using the currently applicable parameters at that time. Therefore, no further action is necessary.

Revision 1 PC-2, issued 5/7/2004, changed the internal organ for codes 231.8, 235.8 and 235.9 from lung to "medical review". No claims with these codes were completed prior to this revision therefore, no further action is necessary.

The next change representing an increase was code 150 in revision 2. The change was to consider stomach cancer (both target organ and cancer model) for cases of esophageal cancer when the cancer was an adenocarcinoma of the lower third of the esophagus. Sixty four cases with a POC less than 50% were completed prior to the date of revision 2. Twenty five of these were later returned and revised for other reasons. Of the thirty nine remaining, only six indicated both adenocarcinoma and the lower third of the esophagus. Two of these qualified for compensation under an SEC so no further evaluation was performed. The remaining four were re-evaluated using current dose reconstruction methods. None of the four resulted in a POC greater than 50%.

In revision 3, code 155.1 was changed to specify liver as the appropriate internal dose organ for some cases that may have been previously completed using the gallbladder. Twenty three claims with a code 155.1 were completed prior to revision 3. Of these, eight had qualified for compensation under an SEC. Twelve of the remaining had been completed using gallbladder as the internal dose target organ and the remaining three were completed using a complex-wide approach applicable to gallbladder but not applicable to the liver. All fifteen were re-evaluated using current dose reconstruction methods. Two of the fifteen resulted in a POC greater than 50%.

Revision 4 added basal cell carcinoma to the considered cancer models for code 232. 879 claims with code 232 were completed prior to revision 4. Only 16 of these had a cancer cell type that was not specified. Since OTIB-5 indicates only the specified cell type should be used when it is specified, only the 16 claims with unspecified cell types were re-evaluated. None of the 16 resulted in a POC greater than 50%.

Also in revision 4, the target organs for codes 238.0 and 239.2 were changed. Five cases with code 238.0 were completed prior to this revision. Four of these cases had a cancer description listed as myelodysplastic syndrome or myeloproliferative disorder. Both of these cancers are specifically listed as 238.7 which have a target organ of red bone marrow. Therefore, the appropriate target organ was used for these cases and no further evaluation was performed. The remaining claim was re-evaluated using current dose reconstruction methods. It resulted in a POC less than 50%.

Code 239.2 may be used for either a bone cancer or a skin cancer. The OTIB provides both options but only the target organ for the bone cancer was changed. One claim was completed with a code 239.2 prior to this revision. This claim was for a skin cancer and since that portion of code 239.2 was not changed, no further evaluation was performed.

No claims with a code 236.91 or 238.3 have been received at NIOSH. Fifteen claims with a code 238.2 and a POC less than 50% were completed prior to revision 4 of OTIB-5. The revision changed the internal dose from "medical review" to "skin". Each of the fifteen claims was reviewed and all fifteen had previously used skin as the internal target organ. Therefore, no further evaluation was necessary.

Revision 5 added chronic lymphocytic leukemia (CLL). Previously it was not considered radiogenic according to 42 CFR 81.30 so this cancer was not typically forwarded to NIOSH by the Department of Labor (DOL). The DOL is reviewing old claims and returning those with CLL as a verified cancer. Those are being reworked at NIOSH as any cases would with a new cancer added. Therefore, this change is being considered an additional cancer rather than a change to dose reconstruction methods and no further evaluation is necessary under this PER.

4.0 Summary

As part of this PER, thirty six claims were re-evaluated to determine the effect of revisions to OTIB-5. Two claims resulted in a new probability of causation greater than 50%, both as a result of changing the internal dose target organ from gallbladder to liver for code 155.1. None of the remaining thirty four claims exceeded a probability of causation of 45%. NIOSH will provide the Department of Labor with the list of the thirty-six claims evaluated under this PER. NIOSH will also request from the Department of Labor that the two claims now greater than 50% be returned to NIOSH for a new dose reconstruction.