

TDMS No. 60311 - 06

**P05: INCIDENCE RATES OF NEOPLASMS BY ANATOMIC SITE (SYSTEMIC LESIONS
ABRIDGED) (a)**

Date Report Requested: 09/08/2011

Test Type: CHRONIC

Cobalt

Time Report Requested: 08:22:41

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: 7440-48-4

First Dose M/F: 05/15/06 / 05/15/06

Species/Strain: MICE/B6C3F1

Lab: BNW

F1_M3

C Number: C60311
Lock Date: 12/03/2008
Cage Range: ALL
Date Range: ALL
Reasons For Removal: ALL
Removal Date Range: ALL
Treatment Groups: Include ALL
Study Gender: Both
TDMSE Version: 2.4.2.1_003
PWG Approval Date: NONE

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Lab: BNW

B6C3F1 MICE MALE	control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
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Disposition Summary

Animals Initially In Study	50	50	50	50
Early Deaths				
Moribund Sacrifice	5	13	12	17
Natural Death	6	6	9	8
Survivors				
Moribund Sacrifice			1	3
Terminal Sacrifice	39	31	28	22
Animals Examined Microscopically	50	50	50	50

ALIMENTARY SYSTEM

Esophagus	(50)	(50)	(50)	(50)
Gallbladder	(43)	(37)	(34)	(35)
Intestine Large, Cecum	(45)	(45)	(44)	(45)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung				1 (2%)
Intestine Large, Colon	(47)	(45)	(45)	(46)
Intestine Large, Rectum	(44)	(44)	(45)	(48)
Intestine Small, Duodenum	(45)	(44)	(44)	(44)
Adenoma	1 (2%)			
Intestine Small, Ileum	(45)	(45)	(43)	(44)
Adenoma	1 (2%)			
Intestine Small, Jejunum	(45)	(45)	(43)	(44)
Liver	(50)	(50)	(50)	(50)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		1 (2%)		1 (2%)
Cholangiocarcinoma		1 (2%)		1 (2%)
Hemangiosarcoma	3 (6%)	1 (2%)	3 (6%)	
Hemangiosarcoma, Multiple	1 (2%)	1 (2%)		
Hepatoblastoma	2 (4%)	2 (4%)		
Hepatocellular Adenoma	15 (30%)	9 (18%)	13 (26%)	11 (22%)
Hepatocellular Adenoma, Multiple	13 (26%)	16 (32%)	8 (16%)	1 (2%)
Hepatocellular Carcinoma	15 (30%)	15 (30%)	11 (22%)	8 (16%)
Hepatocellular Carcinoma, Multiple	10 (20%)	6 (12%)	3 (6%)	1 (2%)

a - Number of animals examined microscopically at site and number of animals with lesion

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B6C3F1 MICE MALE	control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Sarcoma, Metastatic, Mesentery		1 (2%)		
Mesentery	(5)	(5)	(5)	(3)
Sarcoma		1 (20%)		
Pancreas	(50)	(47)	(50)	(50)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung				1 (2%)
Carcinoma, Metastatic, Islets, Pancreatic		1 (2%)		
Salivary Glands	(50)	(49)	(50)	(50)
Stomach, Forestomach	(50)	(48)	(50)	(50)
Sarcoma, Metastatic, Mesentery		1 (2%)		
Stomach, Glandular	(48)	(46)	(48)	(49)
Sarcoma, Metastatic, Mesentery		1 (2%)		
Tooth	(8)	(2)	(2)	(1)

CARDIOVASCULAR SYSTEM

Heart	(50)	(50)	(50)	(50)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		1 (2%)	1 (2%)	2 (4%)
Hemangiosarcoma	1 (2%)		1 (2%)	

ENDOCRINE SYSTEM

Adrenal Cortex	(50)	(49)	(50)	(50)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung			1 (2%)	
Hepatocellular Carcinoma, Metastatic, Liver	1 (2%)			
Bilateral, Subcapsular, Adenoma	1 (2%)			
Subcapsular, Adenoma		4 (8%)	1 (2%)	1 (2%)
Adrenal Medulla	(50)	(49)	(50)	(48)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		1 (2%)		
Islets, Pancreatic	(49)	(47)	(50)	(50)
Adenoma		1 (2%)		
Carcinoma		2 (4%)		
Parathyroid Gland	(29)	(25)	(26)	(27)

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Lab: BNW

B6C3F1 MICE MALE	control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Pituitary Gland	(47)	(49)	(48)	(48)
Thyroid Gland	(49)	(49)	(50)	(49)
GENERAL BODY SYSTEM				
Tissue NOS	(0)	(0)	(0)	(1)
GENITAL SYSTEM				
Coagulating Gland	(0)	(1)	(0)	(1)
Adenoma		1 (100%)		
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung				1 (100%)
Epididymis	(50)	(49)	(50)	(50)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		1 (2%)		1 (2%)
Hemangiosarcoma		1 (2%)		
Penis	(0)	(0)	(0)	(1)
Preputial Gland	(49)	(50)	(49)	(50)
Prostate	(50)	(49)	(48)	(50)
Seminal Vesicle	(48)	(48)	(49)	(50)
Testes	(50)	(49)	(50)	(50)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		1 (2%)		1 (2%)
Interstitial Cell, Adenoma	1 (2%)			
HEMATOPOIETIC SYSTEM				
Bone Marrow	(50)	(49)	(50)	(49)
Hemangiosarcoma	1 (2%)	1 (2%)	2 (4%)	
Lymph Node	(2)	(0)	(1)	(1)
Lymph Node, Bronchial	(26)	(32)	(20)	(24)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		2 (6%)	1 (5%)	2 (8%)
Hepatocellular Carcinoma, Metastatic, Liver		1 (3%)		

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Lab: BNW

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Lymph Node, Mandibular	(37)	(23)	(27)	(37)
Lymph Node, Mediastinal	(34)	(34)	(36)	(44)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		2 (6%)	3 (8%)	
Hepatocellular Carcinoma, Metastatic, Liver		1 (3%)	1 (3%)	
Lymph Node, Mesenteric	(47)	(44)	(44)	(42)
Hemangiosarcoma			1 (2%)	
Spleen	(50)	(48)	(49)	(48)
Hemangioma		1 (2%)		1 (2%)
Hemangiosarcoma	3 (6%)		4 (8%)	3 (6%)
Thymus	(42)	(44)	(40)	(38)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung			1 (3%)	1 (3%)
Hemangiosarcoma			1 (3%)	
Hepatocellular Carcinoma, Metastatic, Liver		1 (2%)		

INTEGUMENTARY SYSTEM

Skin	(50)	(50)	(50)	(49)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		1 (2%)		
Subcutaneous Tissue, Fibrous Histiocytoma		1 (2%)		
Subcutaneous Tissue, Hemangiosarcoma			1 (2%)	
Subcutaneous Tissue, Neural Crest Tumor	1 (2%)		1 (2%)	

MUSCULOSKELETAL SYSTEM

Bone	(50)	(49)	(50)	(50)
Skeletal Muscle	(0)	(3)	(3)	(1)
Head, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung			1 (33%)	
Thoracic, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		3 (100%)	3 (100%)	1 (100%)

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B6C3F1 MICE MALE

control

1.25 mg/m3

2.5 mg/m3

5.0 mg/m3

NERVOUS SYSTEM

Brain	(50)	(50)	(50)	(50)
Peripheral Nerve	(1)	(0)	(0)	(1)
Spinal Cord	(1)	(0)	(0)	(1)

RESPIRATORY SYSTEM

Larynx	(48)	(47)	(49)	(50)
Lung	(50)	(49)	(50)	(50)
Alveolar/Bronchiolar Adenoma	7 (14%)	10 (20%)	14 (28%)	3 (6%)
Alveolar/Bronchiolar Adenoma, Multiple		1 (2%)	1 (2%)	
Alveolar/Bronchiolar Carcinoma	8 (16%)	20 (41%)	18 (36%)	10 (20%)
Alveolar/Bronchiolar Carcinoma, Multiple	3 (6%)	18 (37%)	24 (48%)	36 (72%)
Carcinoma, Metastatic, Islets, Pancreatic		1 (2%)		
Cholangiocarcinoma, Metastatic, Liver				1 (2%)
Hepatoblastoma, Metastatic, Liver		2 (4%)		
Hepatocellular Carcinoma, Metastatic, Liver	9 (18%)	6 (12%)	7 (14%)	1 (2%)
Nose	(50)	(49)	(50)	(50)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung				1 (2%)
Glands, Olfactory Epithelium, Adenoma		1 (2%)		
Trachea	(48)	(47)	(48)	(50)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung			1 (2%)	

SPECIAL SENSES SYSTEM

Eye	(47)	(46)	(43)	(45)
Harderian Gland	(49)	(48)	(48)	(50)
Adenoma	6 (12%)	3 (6%)	4 (8%)	4 (8%)
Carcinoma	2 (4%)	1 (2%)		
Zymbal's Gland	(0)	(1)	(0)	(0)

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B6C3F1 MICE MALE

control

1.25 mg/m3

2.5 mg/m3

5.0 mg/m3

URINARY SYSTEM

	control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Kidney	(50)	(49)	(49)	(50)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		3 (6%)	1 (2%)	2 (4%)
Hepatocellular Carcinoma, Metastatic, Liver		1 (2%)		
Urinary Bladder	(48)	(48)	(50)	(47)
Hemangiosarcoma			1 (2%)	

SYSTEMIC LESIONS

	control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Multiple Organ	*(50)	*(50)	*(50)	*(50)
Histiocytic Sarcoma	1 (2%)			
Lymphoma Malignant	4 (8%)	1 (2%)	1 (2%)	3 (6%)

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* Number of animals with any tissue examined microscopically

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Tumor Summary for Males

Total Animals with Primary Neoplasms (b)	45	49	50	49
Total Primary Neoplasms	100	119	113	83
Total Animals with Benign Neoplasms	35	32	34	19
Total Benign Neoplasms	45	47	41	21
Total Animals with Malignant Neoplasms	36	46	46	48
Total Malignant Neoplasms	54	72	71	62
Total Animals with Metastatic Neoplasms	9	13	11	5
Total Metastatic Neoplasms	10	33	21	17
Total Animals with Malignant Neoplasms Uncertain Primary Site				
Total Animals with Neoplasms Uncertain- Benign or Malignant	1		1	
Total Uncertain Neoplasms	1		1	

*** END OF MALE ***

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b - Primary tumors: all tumors except metastatic tumors

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B6C3F1 MICE FEMALE	control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
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Disposition Summary

Animals Initially In Study	50	50	50	50
Early Deaths				
Moribund Sacrifice	9	12	19	21
Natural Death	5	2	4	3
Survivors				
Natural Death		2		
Terminal Sacrifice	36	34	27	26
Animals Examined Microscopically	50	50	50	50

ALIMENTARY SYSTEM

Esophagus	(50)	(50)	(50)	(50)
Gallbladder	(44)	(41)	(38)	(46)
Intestine Large, Cecum	(46)	(47)	(49)	(48)
Intestine Large, Colon	(46)	(48)	(49)	(49)
Intestine Large, Rectum	(46)	(48)	(48)	(49)
Intestine Small, Duodenum	(45)	(47)	(48)	(49)
Intestine Small, Ileum	(45)	(46)	(49)	(49)
Carcinoma	1 (2%)			
Intestine Small, Jejunum	(45)	(47)	(49)	(49)
Carcinoma		1 (2%)		
Liver	(50)	(50)	(50)	(50)
Hemangiosarcoma	2 (4%)	1 (2%)		
Hepatocellular Adenoma	9 (18%)	13 (26%)	6 (12%)	2 (4%)
Hepatocellular Adenoma, Multiple	10 (20%)	5 (10%)	4 (8%)	
Hepatocellular Carcinoma	6 (12%)	4 (8%)	5 (10%)	2 (4%)
Hepatocellular Carcinoma, Multiple	4 (8%)	3 (6%)		
Hepatocholangiocarcinoma		1 (2%)		
Mast Cell Tumor Malignant	1 (2%)			
Mesentery	(18)	(13)	(10)	(8)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung				1 (13%)
Sarcoma		1 (8%)		
Pancreas	(50)	(50)	(50)	(49)

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Sarcoma, Metastatic, Skin	1 (2%)			
Salivary Glands	(50)	(50)	(50)	(50)
Stomach, Forestomach	(50)	(50)	(50)	(50)
Squamous Cell Papilloma	1 (2%)			
Stomach, Glandular	(48)	(50)	(49)	(49)

CARDIOVASCULAR SYSTEM

Heart	(50)	(50)	(50)	(50)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung	1 (2%)			2 (4%)
Hemangiosarcoma			1 (2%)	

ENDOCRINE SYSTEM

Adrenal Cortex	(50)	(50)	(50)	(48)
Subcapsular, Carcinoma			2 (4%)	
Adrenal Medulla	(50)	(50)	(49)	(48)
Pheochromocytoma Benign	1 (2%)	1 (2%)		
Islets, Pancreatic	(50)	(50)	(50)	(49)
Parathyroid Gland	(28)	(28)	(24)	(32)
Pituitary Gland	(47)	(50)	(48)	(49)
Pars Distalis, Adenoma	3 (6%)	4 (8%)	1 (2%)	
Pars Intermedia, Adenoma		1 (2%)		
Thyroid Gland	(50)	(50)	(50)	(49)
Follicular Cell, Adenoma	1 (2%)			1 (2%)

GENERAL BODY SYSTEM

None

GENITAL SYSTEM

Clitoral Gland	(43)	(44)	(41)	(43)
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B6C3F1 MICE FEMALE	control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Ovary	(48)	(50)	(50)	(50)
Cystadenoma	1 (2%)	4 (8%)		3 (6%)
Hemangiosarcoma		1 (2%)	1 (2%)	
Osteosarcoma, Metastatic, Bone			1 (2%)	
Yolk Sac Carcinoma	1 (2%)			
Uterus	(49)	(50)	(50)	(50)
Hemangiosarcoma		2 (4%)		
Polyp Stromal	2 (4%)	1 (2%)	1 (2%)	1 (2%)
Endometrium, Carcinoma		1 (2%)		
Vagina	(0)	(0)	(1)	(0)

HEMATOPOIETIC SYSTEM

Bone Marrow	(50)	(50)	(50)	(50)
Mast Cell Tumor Malignant	1 (2%)			
Lymph Node	(11)	(8)	(7)	(1)
Lumbar, Carcinoma, Metastatic, Kidney	1 (9%)			
Lymph Node, Bronchial	(22)	(33)	(34)	(22)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung	2 (9%)	1 (3%)	1 (3%)	1 (5%)
Lymph Node, Mandibular	(40)	(41)	(38)	(31)
Mast Cell Tumor Malignant	1 (3%)			
Lymph Node, Mediastinal	(42)	(39)	(44)	(46)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung	2 (5%)	1 (3%)	3 (7%)	3 (7%)
Mast Cell Tumor Malignant	1 (2%)			
Lymph Node, Mesenteric	(49)	(49)	(47)	(47)
Sarcoma, Metastatic, Skin	1 (2%)	1 (2%)		
Spleen	(49)	(49)	(48)	(49)
Hemangioma		1 (2%)		
Hemangiosarcoma	2 (4%)		1 (2%)	
Mast Cell Tumor Malignant	1 (2%)			
Thymus	(46)	(46)	(46)	(46)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung	1 (2%)			2 (4%)
Neoplasm Nos	1 (2%)			

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Osteosarcoma, Metastatic, Bone			1 (2%)	
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INTEGUMENTARY SYSTEM

Mammary Gland	(48)	(50)	(50)	(50)
Carcinoma	1 (2%)		1 (2%)	
Skin	(50)	(50)	(49)	(50)
Subcutaneous Tissue, Hemangioma				1 (2%)
Subcutaneous Tissue, Hemangiosarcoma		2 (4%)		
Subcutaneous Tissue, Neural Crest Tumor	1 (2%)			
Subcutaneous Tissue, Sarcoma	2 (4%)	2 (4%)	2 (4%)	
Subcutaneous Tissue, Sarcoma, Multiple		1 (2%)		

MUSCULOSKELETAL SYSTEM

Bone	(50)	(50)	(50)	(50)
Osteosarcoma			1 (2%)	
Vertebra, Schwannoma Malignant, Metastatic, Peripheral Nerve			1 (2%)	
Skeletal Muscle	(0)	(2)	(1)	(0)
Thoracic, Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		1 (50%)	1 (100%)	

NERVOUS SYSTEM

Brain	(50)	(50)	(50)	(50)
Peripheral Nerve	(0)	(0)	(1)	(0)
Schwannoma Malignant			1 (100%)	

RESPIRATORY SYSTEM

Larynx	(47)	(50)	(50)	(47)
Lung	(49)	(50)	(50)	(50)
Alveolar/Bronchiolar Adenoma	3 (6%)	8 (16%)	8 (16%)	9 (18%)

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Alveolar/Bronchiolar Adenoma, Multiple		1 (2%)		1 (2%)
Alveolar/Bronchiolar Carcinoma	4 (8%)	18 (36%)	18 (36%)	19 (38%)
Alveolar/Bronchiolar Carcinoma, Multiple	1 (2%)	7 (14%)	20 (40%)	24 (48%)
Hepatocellular Carcinoma, Metastatic, Liver	5 (10%)	2 (4%)	1 (2%)	
Osteosarcoma, Metastatic, Bone			1 (2%)	
Nose	(50)	(50)	(50)	(50)
Pleura	(0)	(1)	(0)	(1)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung		1 (100%)		1 (100%)
Trachea	(48)	(50)	(48)	(49)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung			1 (2%)	

SPECIAL SENSES SYSTEM

Eye	(46)	(46)	(48)	(48)
Carcinoma, Metastatic, Harderian Gland		1 (2%)		
Harderian Gland	(49)	(49)	(49)	(50)
Adenoma	3 (6%)	5 (10%)	4 (8%)	3 (6%)
Carcinoma		2 (4%)		
Zymbal's Gland	(0)	(1)	(1)	(0)

URINARY SYSTEM

Kidney	(50)	(50)	(50)	(50)
Alveolar/Bronchiolar Carcinoma, Metastatic, Lung				2 (4%)
Renal Tubule, Adenoma				1 (2%)
Transitional Epithelium, Carcinoma	1 (2%)			
Urinary Bladder	(49)	(49)	(48)	(49)

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* Number of animals with any tissue examined microscopically

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SYSTEMIC LESIONS

Multiple Organ	*(50)	*(50)	*(50)	*(50)
Histiocytic Sarcoma	1 (2%)		1 (2%)	1 (2%)
Lymphoma Malignant	14 (28%)	14 (28%)	12 (24%)	4 (8%)

a - Number of animals examined microscopically at site and number of animals with lesion

* Number of animals with any tissue examined microscopically

Test Type: CHRONIC

Cobalt

Time Report Requested: 08:22:41

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: 7440-48-4

First Dose M/F: 05/15/06 / 05/15/06

Species/Strain: MICE/B6C3F1

Lab: BNW

B6C3F1 MICE FEMALE	control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
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Tumor Summary for Females

Total Animals with Primary Neoplasms (b)	40	47	49	47
Total Primary Neoplasms	81	105	90	72
Total Animals with Benign Neoplasms	29	31	20	17
Total Benign Neoplasms	34	44	24	22
Total Animals with Malignant Neoplasms	31	41	46	44
Total Malignant Neoplasms	45	61	66	50
Total Animals with Metastatic Neoplasms	8	5	8	4
Total Metastatic Neoplasms	14	8	11	12
Total Animals with Malignant Neoplasms Uncertain Primary Site				
Total Animals with Neoplasms Uncertain- Benign or Malignant	2			
Total Uncertain Neoplasms	2			

*** END OF REPORT ***

a - Number of animals examined microscopically at site and number of animals with lesion

b - Primary tumors: all tumors except metastatic tumors