

# DIAGNOSTIC CASE REPORT

U. S. GEOLOGICAL SURVEY-BIOLOGICAL RESOURCES DIVISION  
NATIONAL WILDLIFE HEALTH CENTER-HONOLULU FIELD STATION  
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HONOLULU, HAWAII 96850  
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**Case Number:** 21909

**Submitter Name:**

Ms. Miri Tatarata  
Direction de l'environnement  
BP 4562  
Papeete, French Polynesia 98713  
France

**Species submitted (n):**

Sea Urchin: Diadema sp. (1)  
Turtle: Green (5)

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**SPECIMENS SUBMITTED:** Tissue-Fixed formalin

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**History:** Between April and May of this year, turtles at the lagoon in Bora Bora were found ill and dying. Sea urchins were also seen dying in the lagoon, and there was speculation that they may somehow be linked. The attending veterinarian necropsied 5 turtles and submitted tissues of these animals to the HFS for histopathology. Two urchins (one in formalin and one frozen) were also submitted. No necropsy reports or photos accompanied the samples.

**Findings:** Two turtles had large numbers of trematode eggs in multiple organs. One of these had vacuolated liver and inflammation of intestines. The other had vacuolation of the liver and degeneration of the kidney. The remaining turtles had small numbers of trematode eggs in multiple tissues. Two of these had vacuolation of the liver and another had vacuolation of the heart. The urchin died from a ciliate infection.

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**Final diagnosis:** Accession 1-Undetermined; Accession 2-Enteritis; Accession 3-Vascular flukes; Accession 4-Undetermined; Accession 5-Undetermined; Accession 6-Inflammation.

**Comments:** On aggregate, the lesions were non specific and somewhat reminiscent of a toxic insult (cellular vacuolation in various organs, kidney degeneration) or contact irritant in the gastrointestinal tract (enteritis). Although large numbers of trematode eggs were seen in two turtles, it was difficult to conclude based on that alone that this was the cause of the illness, particularly in light that some of these animals had vacuolation in internal organs as well as intestinal and kidney problems. It is unlikely that the urchin mortality had anything to do with the clinical signs manifested by the turtles.

It is unfortunate that the brains were not sampled. In a previous case of mortality in Tahiti turtles, we noted some animals had very large numbers of trematode eggs in the brain, and in that case, it would have been conceivable that flukes may have had something to do with the neurological signs seen here.

**Management:** According to recent communications, the attending veterinarian has implemented anti-helminthic treatment on the turtles and has seen clinical improvement. Barring us figuring out other causes of the mortality, this may be the best interim management practice. In the meantime, continued detective work will be needed to sort out what is killing turtles in the lagoon.

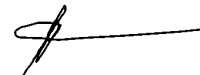
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**Report Date (mm/dd/yyyy):** 7/3/2013

**Necropsy report:** Enclosed

**Copies of this report sent to:**

Mr. George Balazs (NOAA)



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If you have questions regarding this case, contact Thierry M. Work MS, DVM, MPVM at 808-792-9520. Include above Case Number. Diagnostic findings may not be used for publication without the pathologist's knowledge and consent.

**NOTE: Information in this report supersedes any information from previous reports regarding this case**

NATIONAL WILDLIFE HEALTH CENTER  
NECROPSY REPORT

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**Submitter Name:**

Ms. Miri Tatarata  
Direction de l'environnement  
BP 4562  
Papeete, French Polynesia 98713  
France

Case: 21909  
Accession: 1  
Date Collected: 04/17/2012  
Date Examined: 4/24/2013  
Prosector: Unknown  
Pathologist: T. M. Work

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**Signalment-Morphometrics-History**

CONDITION: (Unknown) POSTMORTEM: (Good) EUTHANASIA: (Not euthanized)

TAG TYPE: (Reference Number) TAG NO.: (Goutte deau)

SPECIES: (Turtle: Green) AGE: (Immature) SEX: (Unknown)

MORPHOMETRICS: Weight carcass (7 kg), Curved carapace length (41.5 cm), Curved carapace width (37.5 cm).

COLLECTION-SITE: (Bora Bora) AREA: (Society Islands) STATE: (French Polynesia)  
COUNTRY: (France)

HISTORY: Turtle identification: Goutte deau. This animal was part of a series of sick turtles in the lagoon who were manifesting unexplained clinical signs. The animal died on 16 April, 2013. The animal was necropsied the next day by the attending veterinarian Etienne Zipper. No necropsy reports or photos accompanied the samples.

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**External/Internal**

EXTERNAL:

INTERNAL:

PRELIMINARY DIAGNOSIS: Undetermined.

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**Samples**

SECIMENS RECEIVED: Tissue-Fixed formalin.

HISTO: Spleen, Kidney (A); Kidney, Skeletal muscle, Skin (B); Intestine small (C); Stomach, Intestine small (D).

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**Laboratory Results**

**HISTOPATHOLOGY**

Intestine small: Moderate numbers of mainly round trematode eggs surrounded by macrophages and giant cells are within the lamina propria and submucosa.

Skin: A mild localized dermal infiltrate of lymphoid cells is present. Rare round-to-elongate trematode eggs surrounded by giant cells are within dermis.

Kidney: Round trematode eggs are scattered among proximal tubules and are surrounded by macrophages and giant cells.

Spleen: Moderate numbers of mainly round trematode eggs are scattered throughout. The spleen is moderately autolyzed.

All other Organs: No remarkable lesions are seen.

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COMMENTS:This animal had a vascular fluke infection but this did not appear severe enough to cause death or clinical signs.

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Final Diagnosis (in order of importance)

| Diagnosis       | Topog     | Morpho | Etiol     | Func      | Dis | Link |
|-----------------|-----------|--------|-----------|-----------|-----|------|
| 1. Undetermined | (T00010 ) | ( )    | (E00040 ) | (FY3500 ) | ( ) | ( )  |

Diagnostic findings may not be published without the knowledge and consent of the pathologist. Milt Code: (Open)

**NATIONAL WILDLIFE HEALTH CENTER  
NECROPSY REPORT**

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**Submitter Name:**

Ms. Miri Tatarata  
Direction de l'environnement  
BP 4562  
Papeete, French Polynesia 98713  
France

Case: 21909  
Accession: 2  
Date Collected: 04/25/2012  
Date Examined: 4/24/2013  
Prosector: Unknown  
Pathologist: T. M. Work

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**Signalment-Morphometrics-History**

CONDITION: (Unknown) POSTMORTEM: (Good) EUTHANASIA: (Not euthanized)

TAG TYPE: (Reference Number) TAG NO.: (NAD 339)

SPECIES: (Turtle: Green) AGE: (Immature) SEX: (Unknown)

MORPHOMETRICS: Weight carcass (26 kg), Curved carapace length (63 cm), Curved carapace width (56 cm).

COLLECTION-SITE: (Bora Bora) AREA: (Society Islands) STATE: (French Polynesia)  
COUNTRY: (France)

HISTORY: Turtle identification: NAD 339/NAG 087. This animal was part of a series of sick turtles in the lagoon who were manifesting unexplained clinical signs. The animal died on 25 April, 2013 and was necropsied by Etienne Zipper, the attending veterinarian. No necropsy reports or photos accompanied the samples.

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**External/Internal**

EXTERNAL:

INTERNAL:

PRELIMINARY DIAGNOSIS: Undetermined.

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**Samples**

SECIMENS RECEIVED: Tissue-Fixed formalin.

HISTO: Heart, Artery large (A); Spleen, Liver (B); Lung (C); Kidney, Intestine small (D); Stomach, Intestine small (E); Stomach (F).

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**Laboratory Results**

**HISTOPATHOLOGY**

Stomach: Small numbers of mostly round round trematode eggs surrounded by macrophages and giant cells are within lamina propria. Within submucosa is a nidus of stellate clefts surrounded by cells manifesting cytoplasmic hypereosinophilia and pyknosis. Within another section, occasional nidi of necrosis are within superficial mucosa.

Intestine small: Diffusely, mucosal cells are shrunken, hypereosinophilic with pyknotic nuclei and are sloughing into the lumen.

Liver: Rare round trematode eggs surrounded by macrophages and giant cells are present. Diffusely, hepatocytes are distended by variably sized round vacuoles.

Artery large: A prominent mononuclear infiltrate is within the media just below the

adventitia. and mild subintimal localized mononuclear infiltrates are present.

Heart: A prominent mononuclear infiltrate is within the media just belo the adventitia. and mild subintimal localized mononuclear infiltrates are present.

Spleen: A prominent mononuclear infiltrate is within the media just belo the adventitia. and mild subintimal localized mononuclear infiltrates are present.

Lung: Rare round trematode eggs surrounded by macrophages and giant cells are present within smooth muscle.

All other Organs: No remarkable lesions are seen.

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COMMENTS:The most significant finding was the evidence of localized inflammation of the small intestinal mucosa the cause of which was unknown. The turtle also had a mild infection with vascular flukes but not severe enough to cause death.

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Final Diagnosis (in order of importance)

| Diagnosis          | Topog     | Morpho    | Etiol     | Funct | Dis | Link |
|--------------------|-----------|-----------|-----------|-------|-----|------|
| 1. Enteritis       | (T50500 ) | (M42100 ) | ( )       | ( )   | ( ) | ( )  |
| 2. Vascular flukes | (T40000 ) | ( )       | (E46500 ) | ( )   | ( ) | ( )  |

Diagnostic findings may not be published without the knowledge and consent of the pathologist. Milt Code: (Other)

NATIONAL WILDLIFE HEALTH CENTER  
NECROPSY REPORT

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**Submitter Name:**

Ms. Miri Tatarata  
Direction de l'environnement  
BP 4562  
Papeete, French Polynesia 98713  
France

Case: 21909  
Accession: 3  
Date Collected: 04/27/2012  
Date Examined: 4/24/2013  
Prosector: Unknown  
Pathologist: T. M. Work

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**Signalment-Morphometrics-History**

CONDITION: (Unknown) POSTMORTEM: (Good) EUTHANASIA: (Not euthanized)

TAG TYPE: () TAG NO.: ()

SPECIES: (Turtle: Green) AGE: (Immature) SEX: (Unknown)

MORPHOMETRICS: Weight carcass (10 kg), Curved carapace length (47.5 cm), Curved carapace width (43.4 cm).

COLLECTION-SITE: (Bora Bora) AREA: (Society Islands) STATE: (French Polynesia)  
COUNTRY: (France)

HISTORY: This animal had no identification. This animal was part of a series of sick turtles in the lagoon who were manifesting unexplained clinical signs. The animal started getting sick on 18 April 2013. The animal was on corticosteroid treatment and antibiotics beginning on 4-18-12, but died and was necropsied on 4-27-12 by Etienne Zipper, the attending veterinarian. No necropsy reports or photos accompanied the samples.

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**External/Internal**

EXTERNAL:

INTERNAL:

PRELIMINARY DIAGNOSIS: Undetermined.

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**Samples**

SECIMENS RECEIVED: Tissue-Fixed formalin.

HISTO: Spleen, Liver (A); Lung, Kidney (B); Parathyroid, Heart, Artery large (C); Trachea (D); Intestine small, Intestine large (E); Forestomach, Esophagus, Intestine small, Pancreas (F).

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**Laboratory Results**

HISTOPATHOLOGY

Esophagus: Prominent mononuclear infiltrates are within subucosa.

Stomach: Large numbers of mostly round round trematode eggs in clusters surrounded by macrophages and giant cells are within lamina propria and muscularis.

Heart: Small numbers of mostly round round trematode eggs surrounded by macrophages and giant cells are present.

Parathyroid: Large numbers of mostly round round trematode eggs in clusters surrounded by macrophages and giant cells are present.

Kidney: Small numbers of mostly round round trematode eggs surrounded by macrophages and giant cells are present. Numerous proximal tubules manifest cytoplasmic hypereosinophilia and granulation.

Lung: Large numbers of mostly round round trematode eggs surrounded by prominent macrophages and giant cells are present.

Spleen: Small numbers of mostly round round trematode eggs surrounded by macrophages and giant cells are present. Melanized macrophages are noticeable.

Liver: One section has localized areas of vacuolation mainly in cords surrounding portal veins. A trematode is within a blood vessel. Small numbers of mostly round round trematode eggs surrounded by macrophages and giant cells are present.

All other Organs: No remarkable lesions are seen.

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COMMENTS: The most significant finding was large numbers of trematode eggs in multiple organs. The animal also had evidence of acute kidney problems.

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Final Diagnosis (in order of importance)

| Diagnosis          | Topog     | Morpho    | Etiol     | Funct | Dis | Link |
|--------------------|-----------|-----------|-----------|-------|-----|------|
| 1. Vascular flukes | (T40000 ) | ( )       | (E46500 ) | ( )   | ( ) | ( )  |
| 2. Nephrosis       | (T71000 ) | (M53150 ) | ( )       | ( )   | ( ) | ( )  |

Diagnostic findings may not be published without the knowledge and consent of the pathologist.

Milt Code: (Infectious disease)



NATIONAL WILDLIFE HEALTH CENTER  
NECROPSY REPORT

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**Submitter Name:**

Ms. Miri Tatarata  
Direction de l'environnement  
BP 4562  
Papeete, French Polynesia 98713  
France

Case: 21909  
Accession: 4  
Date Collected: 05/09/2012  
Date Examined: 4/24/2013  
Prosector: Unknown  
Pathologist: T. M. Work

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**Signalment-Morphometrics-History**

CONDITION: (Unknown)                      POSTMORTEM: (Good)                      EUTHANASIA: (Not euthanized)  
TAG TYPE: (Reference Number) TAG NO.: (NAD 074)  
SPECIES: (Turtle: Green)                      AGE: (Immature)                      SEX: (Unknown)  
MORPHOMETRICS: Curved carapace length (58 cm), Curved carapace width (56.5 cm).  
COLLECTION-SITE: (Bora Bora) AREA: (Society Islands) STATE: (French Polynesia)  
COUNTRY: (France)

HISTORY: Turtle identification: NAD 074/NAD 075. This animal was part of a series of sick turtles in the lagoon who were manifesting unexplained clinical signs. The animal died on 9 May 2013 and was necropsied by Etienne Zipper, the attending veterinarian. No necropsy reports or photos accompanied the samples.

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**External/Internal**

EXTERNAL:

INTERNAL:

PRELIMINARY DIAGNOSIS: Undetermined.

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**Samples**

SECIMENS RECEIVED: Tissue-Fixed formalin.

HISTO: Spleen, Liver (A); Kidney (B); Heart (C); Trachea (D); Lung, Esophagus (E); Intestine small, Artery large (F); Skeletal muscle, Fat (G); Stomach (H); Intestine small (I).

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**Laboratory Results**

**HISTOPATHOLOGY**

Intestine small: Large numbers of mostly round trematode eggs in clumps surrounded by macrophages and giant cells are present.

Esophagus: Diffuse hemorrhage exists within skeletal muscle.

Lung: Rares of mostly round round trematode eggs surrounded by macrophages and giant cells are within smooth muscle.

Liver: Diffusely, hepatocytes are markedly vacuolated. Small numbers of mostly round round trematode eggs surrounded by macrophages and giant cells are present.

Spleen: Scattered clumps of mostly round round trematode eggs surrounded by macrophages and giant cells are present.

All other Organs: No remarkable lesions are seen.

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COMMENTS:None

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Final Diagnosis (in order of importance)

| Diagnosis       | Topog     | Morpho | Etiol     | Funct     | Dis | Link |
|-----------------|-----------|--------|-----------|-----------|-----|------|
| 1. Undetermined | (T00010 ) | ( )    | (E00040 ) | (FY3500 ) | ( ) | ( )  |

Diagnostic findings may not be published without the knowledge and consent of the pathologist.

Milt Code: (Open)

N A T I O N A L   W I L D L I F E   H E A L T H   C E N T E R  
N E C R O P S Y   R E P O R T

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**Submitter Name:**

Ms. Miri Tatarata  
Direction de l'environnement  
BP 4562  
Papeete, French Polynesia 98713  
France

Case: 21909  
Accession: 5  
Date Collected: 04/04/2013  
Date Examined: 4/24/2013  
Prosector: Unknown  
Pathologist: T. M. Work

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**Signalment-Morphometrics-History**

CONDITION: (Unknown)                      POSTMORTEM: (Good)                      EUTHANASIA: (Not euthanized)  
TAG TYPE: (Reference Number) TAG NO.: (NAD J001)  
SPECIES: (Turtle: Green)                      AGE: (Immature)                      SEX: (Unknown)  
MORPHOMETRICS: Weight carcass (15.4 kg), Curved carapace length (54 cm).  
COLLECTION-SITE: (Bora Bora) AREA: (Society Islands) STATE: (French Polynesia)  
COUNTRY: (France)

HISTORY: Turtle identification: Temoe, NAD J001. This animal was part of a series of sick turtles in the lagoon who were manifesting unexplained clinical signs. This animal died on 4-3-13 and was necropsied the following day by Etienne Zipper, the attending veterinarian. No necropsy reports or photos accompanied the samples.

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**External/Internal**

EXTERNAL:

INTERNAL:

PRELIMINARY DIAGNOSIS: Undetermined.

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**Samples**

SECIMENS RECEIVED: Tissue-Fixed formalin.  
HISTO: Heart, Liver, Lung (A); Spleen, Kidney (B).

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**Laboratory Results**

**HISTOPATHOLOGY**

Kidney: Scattered clumps of mostly round round trematode eggs surrounded by macrophages and giant cells are present.

Spleen: White and red pulp are prominent. Melanized macrophages are noticeable.

Heart: Diffusely, myocardial cells are vacuolated. Small numbers of mostly round round trematode eggs surrounded by macrophages and giant cells are present.

Liver: Diffusely, hepatocytes are mildly vacuolated.

All other Organs: No remarkable lesions are seen.

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COMMENTS: None

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Final Diagnosis (in order of importance)

| Diagnosis       | Topog     | Morpho | Etiol     | Funct     | Dis | Link |
|-----------------|-----------|--------|-----------|-----------|-----|------|
| 1. Undetermined | (T00010 ) | ( )    | (E00040 ) | (FY3500 ) | ( ) | ( )  |

Diagnostic findings may not be published without the knowledge and consent of the pathologist.

Milt Code: (Open)

**NATIONAL WILDLIFE HEALTH CENTER  
NECROPSY REPORT**

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**Submitter Name:**

Ms. Miri Tatarata  
Direction de lenvironnement  
BP 4562  
Papeete, French Polynesia 98713  
France

Case: 21909  
Accession: 6  
Date Collected: 00/00/2013  
Date Examined: 4/24/2013  
Prosector: Unknown  
Pathologist: T. M. Work

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**Signalment-Morphometrics-History**

CONDITION: (Unknown)                      POSTMORTEM: (Good)                      EUTHANASIA: (Not euthanized)  
TAG TYPE: ( ) TAG NO.: ( )  
SPECIES: (Sea Urchin: Diadema sp.)                      AGE: (Unknown)                      SEX: (Unknown)

COLLECTION-SITE: (Bora Bora) AREA: (Society Islands) STATE: (French Polynesia)  
COUNTRY: (France)

HISTORY: This formalin-fixed urchin was submitted along with the formalin-fixed turtle tissues. Urchins had been seen dying in the lagoon at about the same time as turtles.

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**External/Internal**

EXTERNAL:

INTERNAL:

PRELIMINARY DIAGNOSIS: Undetermined.

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**Samples**

SECIMENS RECEIVED: Tissue-Fixed formalin.

HISTO: Intestine, Muscle (A); Intestine, Gonad, Muscle (B); Water canal, Intestine, Muscle, Gonad (C); Water canal, Tube foot, Test, Nerve ring, Intestine, Gonad (D).

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**Laboratory Results**

**HISTOPATHOLOGY**

Tube foot: Clumps of cellular debris, eosinophilic granular cells, and syncytia are within the lumen of tube feet. Other tube feet have lumina replete with cellular debris mixed with ciliates.

Test: Within one section (D), infiltrates of eosinophilic granular cells are present.

All other Organs: No remarkable lesions are seen.

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COMMENTS: Microscopy indicated the urchins were dying from ciliate infections.

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Final Diagnosis (in order of importance)

| Diagnosis       | Topog | Morpho    | Etiol     | Funct | Dis | Link |
|-----------------|-------|-----------|-----------|-------|-----|------|
| 1. Inflammation | ( )   | (M42100 ) | ( )       | ( )   | ( ) | (AW) |
| 2. Ciliate      | ( )   | ( )       | (L53000 ) | ( )   | ( ) | ( )  |

Diagnostic findings may not be published without the knowledge and consent of the

21909-6  
pathologist.

Page 2 of 2  
Milt Code: (Other)