

CASES FOR TRAINING OF THE INTERNATIONAL URINARY TRACT INFECTION BASIC SPINAL CORD INJURY DATA SET

The five cases included were prepared by Drs. Bon San Bonne Lee, Jürgen Pannek, Fin Biering-Sørensen and Lance Goetz. The cases were reviewed and adjusted for inconsistencies by the others in the working group for the International Spinal Cord Injury Urinary Tract Infection Basic Data Set, and by an external reviewer, Dr. Adam Klausner, to whom we are indebted for his careful review and expert comments. If the readers find specific issues requiring clarification, or any other issues related to the International Spinal Cord Injury Urinary Tract Infection Basic Data Set that may be improved, please inform the working group for this Data Set.

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CASE 1 FOR INTERNATIONAL SPINAL CORD INJURY URINARY TRACT INFECTION (UTI) BASIC DATA SET TRAINING

This seventy year old woman with C6 AIS A complete tetraplegia who lives alone with home care support manages her bladder with a 22 French suprapubic catheter. Her past medical history is significant for renal stones 5 years ago which required treatment with lithotripsy. She takes cranberry tablets for UTI prophylaxis. She presented on July 6, 2010 with abdominal swelling, decreased urine output, and confusion times approximately 10 days. She had fluctuating blood pressures up to 170 mm Hg systolic. She stated that she feels "sick". She has foul smelling, cloudy urine. UTI was among the differential diagnoses. Chemistries revealed mild hyponatraemia and hypokalaemia. Urine culture revealed *E. coli* ($> 10^5$ CFU/mL) sensitive to all antibiotics.

INTERNATIONAL SPINAL CORD INJURY DATA SETS URINARY TRACT INFECTION BASIC DATA SET (Version 1.0) - FORM

Date of data collection: 2010 07 06

Length of time of sign(s)/symptom(s) (tick one only):

- Less than 1 day 1 to 3 days 4 days-1 week >1week-2 weeks
 >2weeks-1 month >1month-3 months > 3 months

Signs/symptoms (tick all that apply):

- Fever (greater than 38.2 C)
 Incontinence, onset or increase in episodes, including leaking around catheter
 Spasticity, increased
 Malaise, lethargy or sense of unease
 Cloudy urine (with or without mucus or sediment) with increased odor
 Pyuria
 Discomfort or pain over the kidney or bladder or during micturition
 Autonomic dysreflexia
 Other _____

Urine dipstick test for nitrite (tick one only):

Negative Positive Unknown

Urine dipstick test for leukocyte esterase (tick one only):

Negative Positive Unknown

Urine culture (tick one only):

Negative Positive Unknown

If positive, give species and amount of colony forming units (CFU)/mL (10^1 - 10^5 CFU/mL), and the resistance pattern:

- 1) E. coli species, $>10^5$ CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 2) species, CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 3) species, CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 4) species, CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 5) species, CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)

CASE 2 FOR INTERNATIONAL SPINAL CORD INJURY URINARY TRACT INFECTION BASIC DATA SET TRAINING

This 40 year old Caucasian woman with a history of thoracic 12 incomplete (AIS C) paraplegia after a car accident in January 2000 managed her bladder by intermittent catheterization and repeated detrusor botulinum-toxin A injections. On October 14, 2012, she presented to our outpatient centre with a two day history of urinary urgency, incontinence, leakage of small volumes of urine between catheterizations, suprapubic pain, chills, and uneasiness. The urine was malodorous and cloudy. Urine dipstick, urinalysis and culture were obtained.

Urine dipstick showed: Negative nitrite, positive leukocyte esterase.
Urine culture:

>100,000 CFU/ML Enterococcus spp

ANTIBIOTIC SUSCEPTIBILITY TEST RESULTS:

Enterococcus spp:

Ampicillin	S
Amoxicillin	S
Amoxicillin/CA	S
Piperacillin/Tazobactam	S
Imipenem	S
Cefepime	R
Ceftazidime	R
Ceftriaxone	R
Cefuroxime oral	R
Cefuroxime i.v.	R
Gentamicin	R
Ciprofloxacin	S
Levofloxacin	S
Moxifloxacin	S
Norfloxacin	S
Trimethoprim/Sulfa	R
Nitrofurantoin	S
Tigecycline	S
Vancomycin	S

S=Sensitive, R=Resistant, I=Intermediate

The patient did not develop fever but complained of shaking chills. Blood pressure and pulse rate remained normal (105/65 mm Hg, pulse rate 65). She did not develop signs of autonomic dysreflexia, like headache, blurred vision or apprehension. The patient was subsequently treated with oral ciprofloxacin with resolution of her symptoms.

INTERNATIONAL SPINAL CORD INJURY DATA SETS

URINARY TRACT INFECTION BASIC DATA SET (Version 1.0) - FORM

Date of data collection: 2012 14 10

Length of time of sign(s)/symptom(s) (tick one only):

- Less than 1 day 1 to 3 days 4 days-1 week >1week-2 weeks
 >2weeks-1 month >1month-3 months > 3 months

Signs/symptoms (tick all that apply):

- Fever (greater than 38.2 C)
 Incontinence, onset or increase in episodes, including leaking around catheter
 Spasticity, increased
 Malaise, lethargy or sense of unease
 Cloudy urine (with or without mucus or sediment) with increased odor
 Pyuria (considered positive if positive leukocyte esterase)
 Discomfort or pain over the kidney or bladder or during micturition
 Autonomic dysreflexia
 Other _____

Urine dipstick test for nitrite (tick one only):

- Negative Positive Unknown

Urine dipstick test for leukocyte esterase (tick one only):

- Negative Positive Unknown

Urine culture (tick one only):

- Negative Positive Unknown

If positive, give species and amount of colony forming units (CFU)/mL (10^1 - 10^5 CFU/mL), and the resistance pattern:

- 1) Enterococcus species, >100K____CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes—cephalosporins, gentamicin, sulfa)
- 2) _____ species, _____CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 3) _____ species, _____CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 4) _____ species, _____CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 5) _____ species, _____CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)

CASE 3 FOR INTERNATIONAL SPINAL CORD INJURY URINARY TRACT INFECTION BASIC DATA SET TRAINING

This 54 year old African American man with a prior history of C5 incomplete (AIS C) tetraplegia after a fall in June 2012 hospitalized in July 2012 for rehabilitation and for care of a stage 4 pressure ulcer. In late September, he developed suprapubic pain, lethargy and spasticity which became progressively worse over the course of 8 days. In addition, his temperature curve steadily trended upward. Staff noted cloudiness in the indwelling urethral catheter tubing. Urine dipstick, urinalysis and culture were obtained on 10/4/12.

Urine dipstick showed:
Negative nitrite, small leukocyte esterase

Urine culture
ROUTINE BACTERIAL CULTURE completed: Oct 09, 2012 09:14

* BACTERIOLOGY FINAL REPORT => Oct 09, 2012
CULTURE RESULTS: >100,000 CFU/ML PROVIDENCIA STUARTII

ANTIBIOTIC SUSCEPTIBILITY TEST RESULTS:
PROVIDENCIA STUARTII

:

AMIKACIN	S
AMPICILLIN	R
CEFTAZIDIME	S
CEFAZOLIN	R
CIPROFLOXACIN	R
CEFTRIAZONE	S
ERTAPENEM	S
GENTAMICIN	R
IMIPENEM	S
LEVOFLOXACIN	I
TETRACYCLINE	R
PIP/TAZO	S
TRIMETH\SULFA	S

Bacteriology Remark(s):
>25,000 - <50,000 CFU/ML COAG NEG STAPH, No further workup.
>10,000 - <25,000 CFU/ML 2ND GRAM NEG ROD, No further workup.
S=Sensitive, R=Resistant, I=Intermediate

The patient spiked a fever to 103.1°F (39.5°C) and complained of shaking chills on October 4, 2009. He developed an elevated blood pressure of 175/124 mm Hg and heart rate of 118; however, he denied sweats, headache, blurred vision or apprehension. The patient was subsequently treated with intravenous culture specific antibiotics with resolution of his symptoms.

INTERNATIONAL SPINAL CORD INJURY DATA SETS
URINARY TRACT INFECTION BASIC DATA SET (Version 1.0) - FORM

Date of data collection: 2009 10 04

Length of time of sign(s)/symptom(s) (tick one only):

- Less than 1 day 1 to 3 days 4 days-1 week >1week-2 weeks
 >2weeks-1 month >1month-3 months > 3 months

Signs/symptoms (tick all that apply):

- Fever (greater than 38.2 C)
 Incontinence, onset or increase in episodes, including leaking around catheter
 Spasticity, increased
 Malaise, lethargy or sense of unease
 Cloudy urine (with or without mucus or sediment) with increased odor
 Pyuria (considered positive due to small leukocyte esterase)
 Discomfort or pain over the kidney or bladder or during micturition
 Autonomic dysreflexia
 Other _____

Urine dipstick test for nitrite (tick one only):

- Negative Positive Unknown

Urine dipstick test for leukocyte esterase (tick one only):

- Negative Positive Unknown

Urine culture (tick one only):

- Negative Positive Unknown

If positive, give species and amount of colony forming units (CFU)/mL (10^1 - 10^5 CFU/mL), and the resistance pattern:

- 1) _Providencia stuartii_ species, >100K____CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes—penicillin, cephalosporin, fluoroquinolone, gentamicin, tetracycline)
- 2) _____ species, _____CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 3) _____ species, _____CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 4) _____ species, _____CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 5) _____ species, _____CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)

**CASE 4 FOR INTERNATIONAL SPINAL CORD INJURY URINARY TRACT
INFECTION BASIC DATA SET TRAINING**

This 43 year old man with C6 sensory incomplete (AIS B) tetraplegia since a bomb explosion in 2003 was seen in the outpatient clinic on 28 November 2012. His past medical history was significant for several prior urinary tract infections and a history of very large (up to 1000 ml) catheterization volumes. He noted severe fatigue, intermittent shaking chills, fevers at home to 101.3°F (38.5°C) with sweating, and leakage between intermittent catheterizations over the past 3 weeks. He also complained of left sided back pain and burning in the low centre abdomen. He noted that he had more frequent hip flexor spasms. He also noted increased constipation. He was found in the clinic to have dark, cloudy foul smelling urine and tenderness to percussion at the left costovertebral angle. Urine dipstick revealed positive nitrite and leukocyte esterase. He was admitted to the hospital and begun empirically on piperacillin/tazobactam. Urine final culture was available after 3 days and revealed:

* BACTERIOLOGY FINAL REPORT => Oct 21, 2011

CULTURE RESULTS:

1. >100,000 CFU/ML KLEBSIELLA PNEUMONIAE
2. >100,000 CFU/ML PROTEUS MIRABILIS

ANTIBIOTIC SUSCEPTIBILITY TEST RESULTS:

	1.KLEBSIELLA PNEUMONIAE	2. PROTEUS MIRABILIS
AMIKACIN	S	
AMPICILLIN	R	R
CEFTAZIDIME	R	S
CEFAZOLIN	R	R
CIPROFLOXACIN	R	R
CEFTRIAZONE	R	S
ERTAPENEM	S	S
GENTAMICIN	R	R
IMIPENEM	S	
LEVOFLOXACIN	S	I
TETRACYCLINE	R	R
PIP/TAZO	S	S
TRIMETH\SULFA	R	R

The patient's symptoms resolved following a 2 week course of therapy. He underwent workup for upper tract pathology, repeat fluorourodynamics on antimuscarinic medication and was given further education regarding fluid management.

INTERNATIONAL SPINAL CORD INJURY DATA SETS
URINARY TRACT INFECTION BASIC DATA SET (Version 1.0) - FORM

Date of data collection: 2012 11 28

Length of time of sign(s)/symptom(s) (tick one only):

- Less than 1 day 1 to 3 days 4 days-1 week >1week-2 weeks
 >2weeks-1 month >1month-3 months > 3 months

Signs/symptoms (tick all that apply):

- Fever** (greater than 38.2 C)
 Incontinence, onset or increase in episodes, including leaking around catheter
 Spasticity, increased
 Malaise, lethargy or sense of unease
 Cloudy urine (with or without mucus or sediment) with increased odor
 Pyuria
 Discomfort or pain over the kidney or bladder or during micturition
 Autonomic dysreflexia
 Other increased constipation

Urine dipstick test for nitrite (tick one only):

- Negative Positive Unknown

Urine dipstick test for leukocyte esterase (tick one only):

- Negative Positive Unknown

Urine culture (tick one only):

- Negative Positive Unknown

If positive, give species and amount of colony forming units (CFU)/mL (10^1 - 10^5 CFU/mL), and the resistance pattern:

- 1) Klebsiella pneumoniae species, >10⁵ CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes—penicilins, cephalosporins, fluoroquinolones, aminoglycosides, tetracycline, sulfa)
- 2) Proteus mirabilis species, >10⁵ CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes-- penicilins, cephalosporins, fluoroquinolones, aminoglycosides, tetracycline, sulfa)
- 3) _____ species, _____ CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 4) _____ species, _____ CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)
- 5) _____ species, _____ CFU/mL
Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)

CASE 5 FOR INTERNATIONAL SPINAL CORD INJURY URINARY TRACT INFECTION BASIC DATA SET TRAINING

This 40 year old man with L2 incomplete (AIS B) paraplegia underwent a change of his suprapubic catheter March 22, 2013, and on the same day, developed a fever greater than 102° F (39° C). He also had increased muscular spasms but no other symptoms.

Urinalysis showed >100 WBC/hpf, >100 RBCs/hpf, no epithelial cells.

Urine culture grew:

>100, 000/hpf *Klebsiella pneumoniae*

Amoxicillin/clavulanate	S
Cephalexin	S
Trimethoprim/sulfamethoxazole	R

He was treated with ceftriaxone IV for 1 day, followed by three days of gentamicin and then Augmentin 500mg for 7 days.

INTERNATIONAL SPINAL CORD INJURY DATA SETS URINARY TRACT INFECTION BASIC DATA SET (Version 1.0) - FORM

Date of data collection: 2013 03 22

Length of time of sign(s)/symptom(s) (tick one only):

Less than 1 day 1 to 3 days 4 days-1 week >1week-2 weeks
 >2weeks-1 month >1month-3 months > 3 months

Signs/symptoms (tick all that apply):

Fever (greater than 38.2 C)
 Incontinence, onset or increase in episodes, including leaking around catheter
 Spasticity, increased
 Malaise, lethargy or sense of unease
 Cloudy urine (with or without mucus or sediment) with increased odor
 Pyuria
 Discomfort or pain over the kidney or bladder or during micturition
 Autonomic dysreflexia
 Other _____

Urine dipstick test for nitrite (tick one only):

Negative Positive Unknown

Urine dipstick test for leukocyte esterase (tick one only):

Negative Positive Unknown

Urine culture (tick one only):

Negative Positive Unknown

If positive, give species and amount of colony forming units (CFU)/mL (10^1 -

10^5 CFU/mL), and the resistance pattern:

1) Klebsiella_pneumoniae species, $>10^5$ CFU/mL

Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)

2) _____ $>10^5$ CFU/mL

Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)

3) _____ species, _____CFU/mL

Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)

4) _____ species, _____CFU/mL

Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)

5) _____ species, _____CFU/mL

Resistance pattern (tick one only): Normal Multi-drug resistant (agents from 3 or more different drug classes)