Part I – Human Meets Pathogen

1. The Deadly Dinner Party

Pam Strogess and five other guests went to the dinner party on Sunday night. The meal included:

______________________________________________________________________________

___________________________________________

Pam knew something was wrong because …

Steve Gleason, the host, was home sick with symptoms that included:

What allowed Dr. Pickard to conclude that the diner guest had botulism?

Botulism, from the Latin word *botulus*, means ___________________; dating back an outbreak of the disease …

Describe the biological characteristics of the bacterium *Clostridium botulinum*. 
Explain how the botulism toxin affects the human body.

What is the Achilles heel of the botulism toxin; be specific?

Sketch a concept map of the different types of C. botulinum; be sure to include not only how they are named but what they specifically target for hosts.

Explain what Botox is and how it works as a cosmetic treatment for aging skin conditions like wrinkles.

What is the antitoxin for botulism and why is it so essential that the diagnosis for botulism be precise?
The source of botulism in this case was the ________________.

Like many medical situations, everything has to fall in place to go right or go wrong. So why was the Colavita garlic in oil a perfect source of botulism?

2. Everywhere That Mary Went

Ron Harvey and Rita Osborn decided to have their honeymoon in …

Roy’s symptoms included:

Dr. Mitchell Brodey was not only a primary care physician but specialized in

The combination of the _______________and the ________________
______________, along with the _________________of the case, will usually point the doctor in one of two directions: ________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
What are the two reasons Dr. Brodey admitted Harvey to the hospital?

1)

2)

Dr. Brodey’s professional curiosity was piqued when…

The big question Brodey asked himself was “

Roy Harvey’s blood tested positive for _________________ __________ the causative agent of _________________ ___________

What distinguishes S. typhi from other species of Salmonella?
S. typhi is a _________shaped bacterium.

Symptoms of typhoid fever include:

Despite modern medical care typhoid mortality is ______________.
Control of typhoid fever was not so much a triumph of antibiotics but of ….

Why and how did Dr. Reed change the occurrence of typhoid fever?

Why do doctors refer to the spread of typhoid fever as a “fecal-oral route”?

Every typhoid epidemic can be traced to a _______________  ________________

What is meant by an “asymptomatic carrier”?

Summarize the lesson learned from the Aberdeen, Scotland outbreak.

Dr. Brodey reinterviewed the two men and concluded…

What were the first steps taken by the epidemiologists?
What did the epidemiologists quickly concluded about everyone who had developed typhoid?

In order for the epidemiologists to accomplish their goal of finding the source and preventing more cases they had to do what two important steps?

The great physician and microbiologists Robert Koch hypothesized what about typhoid?

Because of Dr. Koch’s and other’s work, restaurant employees must wash their hands after going to the bathroom because…

Summarize the Mary Mallon story (everywhere that Mary went)

In the end, public health officials determined the cause of this typhoid breakout in upper New York state was due to …
3. The Baby and the Bathwater

Dr. Ramsey diagnosed 14 month old Katie Wolz with simple _____________________.

Fill in the below chart on how bacteria and other microorganisms enter the human body.

<table>
<thead>
<tr>
<th>Entry route</th>
<th>Example(s) of diseases/conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
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</tr>
<tr>
<td>Mucous membranes of the eyes, throat or genital tract</td>
<td>Conjunctivitis, strep tonsillitis, syphilis</td>
</tr>
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</table>

List the causes of gastroenteritis:

Explain why death from dehydration has been successfully reduced.

The causal agent turned out to be ________________________ ______________________ an extremely rare bacterium.

4. Rubbed the Wrong Way
What is the cornerstone of diagnosing a patient with a rash?

Sequence the steps a physician takes in diagnosing a rash

1) demographic facts:

2)

3)

4)

5)

6)

7)

Besides patient history the ___________________ _____________________ is also important.

Dermatologists describe the morphology of rashes by asking what questions?

Why is morphology of a rash considered limited?

Fill in the correct dermatology terms in the table below.

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat spot</td>
<td></td>
</tr>
<tr>
<td>Raised spot</td>
<td></td>
</tr>
<tr>
<td>Papule with pus</td>
<td></td>
</tr>
<tr>
<td>Papule with clear fluid</td>
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</tbody>
</table>

How is distribution of a rash broken down?

Viral infections of the skin are shown as ________________; examples of diseases include:
Limone’s rash was diagnosed by a positive test for the bacterium called ________________________ ________________________.

In Dr. Gordon’s notes he states “bilateral axillary lymphadenopathy”. What does that mean?

What are the two pigments that PA produces?

PA is referred to as an opportunist bacterium; which means …

Folliculitis is …

The American Medical Association published a paper documenting that generalized pustular rashes were found on people who were using …

What are the three variables that investigators determined as common denominators in PA infected hot tubs, whirlpools and swimming pools?

1) 

2) 

3) 

Keratitis is …

PA only infects __________-______________skin.

The authors of the Tennessee study concluded that “prevention of pseudomonas folliculitis should be possible by maintenance of pool water at a pH of ______________and free chlorine levels of ____________.

Why is it more difficult to maintain adequate pH and chlorine levels in heated whirlpools and baths?

Dr. Bottone, knowing PA affinity for water, focused on Limone’s …
Bottone, after testing all of Limone’s toiletries, determined that PA was in Limone’s
____________  _____________ ?

All sponges, natural or synthetic collect bacteria if left ____________and ______________

How did Dr. Bottone conclude that PA strain in the sponge was the same as the one he cultured
from Limone’s skin lesions?

Summarize the ways sponges can be treated to reduce the probability of growing bacteria.

5. The Forbidden Fruit

Michelle and Emily (the almost 4 year old) both had a severe case of ________________?
Most cases are self-limited and the usual treatment is merely to …

Bloody diarrhea generally means …

The heart pumps roughly _________of the body’s blood flow through the kidneys, which filter
the blood to remove ______________  ________________. The wastes are then excreted in the
______________.

Two substances the kidneys remove from the blood are ___________  ___________ and
______________________.

BUN stands for ________________ _______________ ______________.

Normal level of BUN is ________________ ; normal level of creatinine is ____________

When BUN and creatinine exceed these numbers, the condition is known as ____________
_____________________________ or ________________  ________________.
Reasons for kidney failure:

1) Pre-Renal meaning …
This usually means that not enough __________ is getting to the kidneys, sometimes from __________________________ or __________________________.
As blood pressure falls (reducing pressure), kidneys begin to _______ and BUN and creatinine start to __________________________.

2) Post-Renal failure is caused …
A common cause is …

3) Kidney (organ) failure is when the …
Glomerulonephritis is an …
The treatment of a patient with renal failure will depend entirely on …

An ‘artificial kidney’ is known as a ____________________ ______________.

Dr. Rok saw Emily’s BUN was 35 and her creatinine was 2.6. The two other clues were:

1) ...
2) ...

Dr. Rok conclude that Emily had ________________ ______________ ______________.

The medical term for kidney failure is __________________________; the condition that causes shredded cells is ______________.

Most cases are associated with eating food that has been contaminated with

A serotype is a variation in a bacteria’s _____________. Body proteins are designated as ____
And flagella proteins are designated as ______.

The bacteria that was identified as the cause of this bloody diarrhea was designated _______

One mark of a great doctor is the ability to know …
The epidemiologist launched a three-pronged investigation that included:

1) 

2) 

3) 

The investigators finally landed on _______________ ______________ as the prime suspect harboring the E. coli O157:H7.

Why was apple cider a surprise to the investigators?

After determining that apple cider was the source, the next thing the investigators needed to determine was?

Why are apple drops unsafe as a food source or as a source of cider?

Why have lettuce and spinach been contaminated with E. coli?

What are the fundamental steps in food hygiene?

Part II – The External Environment

6. Two Ticks from Jersey

Little Annie’s mother rushed her to the hospital when she noticed…

Not only was Annie weak, she couldn’t speak properly, had double vision but was ataxic meaning…

Her eyes could not move in ________________________.
Unlike chameleons, whose two eyes can move ___________________________, humans are endowed with eyes that track objects only as a _____________________________.

Sketch an eye and the brain and make a ‘wiring diagram’ based on the information on page 76. Label the cranial nerves (III, IV, and VI).

Double vision – or ______________________ is a very serious medical condition. Potential problems include:_________________., ___________________________ and ___________________________.

All of Annie’s blood and urine tests came back normal so the physician ordered brain scans including…

The radiologist thought there was diminished blood flow to the back of the brain; translation ___________________; an odd problem for a five year old.

Stroke is …

Dr. Henretig’s evaluation showed what abnormal neurological abnormalities?

Describe Guillain-Barre syndrome.
Dr. Henretig wanted to perform a spinal tap or ________________ to extract ________________ which acts as a ________________ and ________________ for the brain and spinal cord.

The major clue to the diagnosis of Guillain-Barre syndrome is the dual findings of…

At this point Annie was areflexic meaning…

The doctors tested her lung function by measuring …

Describe the procedure and reason for plasmapheresis.

What does Annie’s mother find?

Why was Lyme disease an incorrect diagnosis for Annie?

Other than bacteria or viruses, *Dermacentor* can cause ____________ CAUSED BY ________________.

Once diagnosed, tick paralysis treatment is simple – just …

The ‘two ticks from jersey’ are ___________________________ and __________________________
7. An Airtight Case

Philip Bradford underwent numerous tests including a bronchoscopy – a test so physicians can determine…

Tomograms which are..

The doctors concluded that Bradford had…

Why did the doctors prescribe a thoracotomy?

What two reasons did Dr. Wilkins cite as to why he didn’t believe Bradford had cancer?

What allowed Dr. Rubin to conclude that something in the environment was the cause of Bradford’s ailment?

Pneumonia is simply an…

What is the difference between infectious pneumonia and hypersensitivity pneumonia?

Describe farmer’s lung.

Describe thermophilic actinomycetes.

What is the purpose of these thermophilic actinomycetes (actually bacteria – two words: Pasteur’s experiments showed for the first time…

What clue finally emerged during Dr. Rubin’s questioning?
HAVAC stands for?

What two events allowed Dr. Rubin to clinch the diagnosis?

The Massachusetts Environmental Protection Agency estimates that ____% of all illnesses are some form of ________ ________________; at an estimated annual cost to society of …

8. Monday Morning Fever

What evidence allowed doctors to conclude that Melville did not have a heart attack?

What did George Melville find out at the water cooler at work?

Melville worked for ________________ ________________ in ________________ ________________

What is flock?

Voltaire wrote, “Work keeps us from …

What two federal agencies were created in 1970?

Polymer means …

PTFE, developed by Plunkett and Dupont goes by the trade name ________________________. 
Professor Peters found from his investigations that people who developed polymer-fume fever were________________________.

What two steps were initiated to halt the outbreaks?

Describe interstitial lung disease.

An abstract is usually a …

Kern and his colleagues coined a new term - ___________ ___________ ___________.

9. The Case of the Wide-Eyed Boy

What is a triage nurse?

What symptom did the triage nurse note about Shawn Matthews?

Shawn had no problem …

What distinguishes emergency medicine from many other specialties?

The _________of the eye is the dark central area that is surrounded by the colored part, the ___________.

Why is the iris the business portion of the eye?

What is the name of the nervous system that controls the sphincter muscles of the eye below chart

<table>
<thead>
<tr>
<th>Autonomic Nervous System</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sympathetic Division</td>
<td></td>
</tr>
<tr>
<td>Parasympathetic Division</td>
<td></td>
</tr>
</tbody>
</table>
What is the function of the posterior communicating artery?

What is meant by a consensual reaction?

An accommodation reflex occurs when…

Describe an aneurysm and how they are diagnosed?

Describe how doctors in the 1980’s treated a subarachnoid hemorrhage.

Nowadays aneurysms are treated by ______________________ which involves…

If an aneurysm occurs in the posterior communicating artery it presses on ___________________________________ causing the pupil to dilate.

Setnick recalled treating a Harvard grad student with similar symptoms, pupil dilation, caused by the chemical ____________________________.

The origin of this chemical is the plant __________________________ (scientific name) commonly called ____________________________.

More than a poison, Renaissance women used a dilute drop of the plant’s juice to …
The name Belladonna comes from …

Medical uses for belladonna included treating:

Symptoms of atropine poisoning result from an imbalance in the …

Doctors used the mnemonic “hot as a hare, blind as a bat, dry as a bone, red as a beet, and mad as a hatter” for the symptoms of atropine poisoning. Transcribe each part of the mnemonic into patient symptoms in the below table.

<table>
<thead>
<tr>
<th>Mnemonic</th>
<th>Transcription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot as a hare</td>
<td></td>
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<tr>
<td>Blind as a bat</td>
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<td>Red as a beet</td>
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</tr>
<tr>
<td>Mad as a hatter</td>
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</tbody>
</table>

On the medical side, atropine has been used in what two medical situations?

“In medicine, we feel…

Setnik seriously thought about sending Shawn to Boston Children’s Hospital for an ________________ but started over by asking Mrs. Matthews questions about?

The cause of Shawn’s headaches were due to?
Part III – The Internal Milieu

10. A Study in Scarlet

What is the setting of this case?

Why did the early inhabitants of New Hampshire not mention the changes in leaf color in autumn?

Define “leaf peepers”.

What were Dr. Guyer’s symptoms?

Describe the components of an allergic reaction.

What effects does histamine cause in allergic reactions?

Why did the doctor’s at who were getting sick call in the hotel’s physician?

Dr. Mary Wilson, an infectious disease specialist was pretty sure Guyer was suffering from?
Describe scombroid poisoning.

How much fish per year is caught and consumed?

Those figures do not count the …

Seafood poisoning accounts for ______percent of all reported food-borne illnesses.

Scombroid outbreaks most often come from __________ and ____________________.

Symptoms of scombroid poisoning include:

IF correctly identified, the cure for scombroid poisoning is?

What 3 conditions are necessary for scombroid poisoning to occur?

1.

2.

3.

To prove the diagnosis of scombroid poisoning, the fish flesh must test positive for what three chemicals?
Seiferth, the sanitarian for the NH department of public health, stated “The fact that the fish was still frozen was crucial for two reasons.” What were the two reasons?

Short of divine intervention, once a fish has spoiled…

The cause of scombroid poisoning is due to improper handling of the fish after being caught. Why is the temperature of the fish once caught so important?

Histidine to histamine occurs because of..

Gutting the fish after catching it helps reduce the chance of scombroid poisoning because…

Scombroid poisoning is not often fatal, but the two reasons to go through the diagnosis are:

1. 

2. 

11. The Case of the Overly Hot Honeymoon

Linda Corsetti was a student at …
Her blood tested positive for a low white blood cell count with an abnormally high …

The two most common causes of a low count are …

Blood cells are manufactured in the ________________  ____________________.

When elevated numbers of lymphocytes are found, what diseases are under suspect?

Corsetti’s brother John was a student at Harvard Medical School studying
______________________________.

The thyroid is a ductless gland that manufactures ________________, which is secretes
directly into the bloodstream.

Thyroxine controls the body’s ________________  ________________

The normal range of thyroxine is ___ - _____ micrograms  per 100 cc of blood.

The narrow range is maintained by intricate feedback loops controlled by the …

Too much thyroxine results in a condition known as?

What did Graves say about educating physicians?

Goiter is a general term used to …

Endemic goiter is due to a lack of ______________________.

Graves disease is an __________________________problem in which the thyroid is whipped
into a frenzy by______________________________.

Corsetti was started on a drug call __________________________(PTU) which
_________________________the thyroids ability to produce its hormone.
Why was it that Linda Corsetti could swim in that 45 degree (F) water when nobody else would even go in?

Although Linda’s symptoms cleared up when on PTU, what changes occurred in her physiology?

What are the two possible treatments for Graves disease?

What are the three possible maladies that a surgery to remove the thyroid, called thyroidectomy, can have?

Why is it not advisable to administer PTU to a pregnant woman?

The thyroid is considered a very vascular gland meaning it is…

What is tetany and why did some patients develop this condition after thyroid surgery?

What is the recommendation for patients needing thyroid surgery today?

12. Feeling His Oats

Dr. Tracey examined Henry Schachte who he operated on for ____________________________eighth years earlier.

Schachte had an obstruction in his _______________ __________________________.

After the stomach comes the __________________________ and then the __________________________ (colon) and then the anus.
The first part of the small intestine called the ________________ has the task of …

The three portions of the small intestine are the ________________, which empties into the ________________ which in turn becomes the ________________.

The ileum empties into the __________________________ or colon at the point where the ________________ lies.

The small intestine gets its name from…

Most nutrients are absorbed in the __________________________, its content is mostly ____________________ from start to finish.

The large intestines job is to absorb ________________, making the waste product, stool, a solid consistency.

Bowel obstructions cause the intestine to swell because…

The abdominal cavity or ____________________ cavity when infected is called ____________________.

What are the two most common causes of bowel obstructions?

A hernia causes ..
An adhesion is …

Most adhesions are a result of …

Pg. 160 Bezoars are …
Pg. 163 Bezoars (in humans) are …
Why might toothless people have a higher incidence of bezoars?

Pharmabezoars are …

What is the connection between cholesterol, fiber, and bezoars?

What did Burkitt, who studied bowel movements, find about fecal output?

What were the benefits found from a high fiber diet?

According to the American Dietetic Association, “dietary fiber is…”

The two types of fiber are __________________ and __________________.

What is the difference between these two types of fiber?

The book *The Eight Week Cholesterol Cure* by Robert Kowalski convinced Henry Schachte to ingest large volumes of ______________ ______________.

Why does fiber produce gas in the colon?

Why is it important to increase water intake as soluble fiber intake is increased?

Schachte’s intestine disorder was diagnosed by the pathologist Tracey as a …

13. The Case of the Unhealthy Health Food

Joanne Young, the fit and health conscious forty-eight year old was told she had a disorder called ________________________.
In modern language, ascites is..

The peritoneal cavity is…

One of the most common and important causes of ascites is ____________disease.

The liver is located in the…

Basically the liver takes in ____________________________________________and makes finished products that are _____________________________________________.

What are the two independent sources of blood to the liver?

Everywhere in the body; the veins carry blood away from a ________________and back to the _____________.

Backed up plumbing called portal __________________________can cause ascites.

Describe the procedure called paracentesis.

A laparoscopy involves…

Hundreds of plants like Heliotropium contain substances called ________________ ________________which cause inflammation of the small hepatic veins.

In the end, after all Linda went through, the cause of her ascites was due to the intake of two herbal teas called ___________________________ and _____________________________.

Herbal remedies are a ____________industry in the U.S. alone.

14. Little Luisa’s Blinding Headache

The two “primary” headache disorders are?
What are the three groups that physicians place patients in after a thorough history and physical exam?

Pg. 187 Doctors, especially neurologist, look at the retina of the eye with an __________________________.

What happens at the retina?

Why is the retina a window to the brain?

The central portion of the retina is called the ________________ ________________.

The papilla is the …

Papilledema is …

What do the veins of the retina do and when they don’t do that it may be a indication of what condition?

Why is an MRI of the brain a superior imaging technique than a CT scan?

What is the scientific basis of an MRI (pg. 189)?

The doctors decided to do a spinal tap to remove some __________________________ from the ______________________________ space.

What are the two functions of cerebrospinal fluid?

Why is the pressure of the fluid also measured?

Luisa’s pressure was ______________________ the norm; the diagnosis was determined to be ..
Doctor’s finally determined that Luisa’s condition was due to toxicity from too much ?

15. Too Much of a Good Thing

Goldberg found that she had a condition called ________________; too much ________________ in the blood serum.

Other than water, the five most common elements in the human body are:

Bernard, the father of physiology, not only was one of the first scientists to use the scientific method in a vigorous way, he defined the physiological concept of _________________.

Summarize why the concept of homeostasis is explained in relation to hypercalcemia.

What problems and symptoms appear from hypercalcemia?

Pg. 201 The most common cause of high blood calcium is..

Based on the links between 18 month old Christa and fifty-eight year old Lou Goldberg and the fact that other cases were being reported, all of which showed patients with no tumors and normal parathyroid function, Dr. Holick concluded that all patients had elevated levels of?

A vitamin is …

Doctors learned about the importance of vitamins, usually due to…

What is meant by the term endemic when describing the occurrence of Rickets in the 1800’s in N.A. and Europe?

Describe Rickets and its cause.

The cure for Rickets was determined to be?
As a result of determining the causes of Rickets, what did dairies in the U.S. do?

What is the connection between calcium (hypercalcemia) and vitamin D?

In the end, hypercalcemia was due to…