Case #1

76 y/o male presents with 6 month history of ‘bone pain’ which is worse at night. He has no history of previous fractures, arthritis, or osteoporosis. Upon further questioning, he admits to decreased hearing. He states that his hat size has also increased recently. An x-ray was ordered.
Case 1 x-ray

X-ray shows cortical thickening, boney overgrowth, and patches of sclerotic bone (cotton wool spots). Compare to normal x-ray.

What is the diagnosis?

Paget’s Disease of the Bone:

The etiology of Paget’s Disease is largely unknown but is thought to result after infection with a paramyxovirus in susceptible people. The infection results in abnormal osseous remodeling defined by three stages: 1) Early lytic or hot phase dominated by osteoclast activity, 2) Intermediate or mixed phase, 3) Cold phase, marked by dense bone formation by osteoblasts.
Case #2

A 26-year old woman presented to the emergency room following a motor vehicle accident. The patient was having difficulty breathing and decreased lung sounds were noted on the left side of the chest. A chest x-ray was ordered.
Case 2 x-ray:

What is indicated by the arrow?

Black on an x-ray indicates air. On the right side, black outlines a normal lung, but on the left the black indicates air in an abnormal pattern. The white densities on the left are also suspicious of abnormal structures within the chest cavity.

Compare to normal chest x-ray

What study would you order next to confirm the diagnosis?
Case 2-barium contrast study

A barium contrast study should be ordered. What is the diagnosis?

X-ray shows intestine has herniated through the left half of the diaphragm which tore in the car accident. Left sided diaphragmatic hernias are more common due to embryologic weakness and the thought that the liver protects the right side of the diaphragm. Right sided diaphragmatic hernias are more likely to present with hemodynamic instability due to compromise in venous return. A barium study was obtained to confirm this diagnosis.
An 72-year old man with a 20 year history of Type II diabetes presents to his primary care physician with chronic pain in the region of the sacral sulcus, below level L5. The physician is concerned the patient may have sacroiliac joint pain syndrome. An A/P pelvis x-ray is ordered to look at the sacroiliac joints.
The sacroiliac joints look normal, but what incidental finding is noted on this x-ray?

Bilateral vas deferens calcifications. What causes this?
Presumably, it is the patient’s long history of diabetes. Just as it affects blood vessels, diabetes can cause calcification of the vas deferens. The mechanism by which this occurs is not fully understood. However, it is believed that high glucose concentrations induce vascular smooth muscle cells (which are present in the walls of blood vessels and vas deferens) to express a number of bone matrix proteins that act to either facilitate or regulate the calcification process. *(Current Diabetes Reports 2003, 3:28-32)* Tuberculosis can also cause vas deferens calcification, but it is usually irregular and unilateral.
Case #4

A 15-year old male presents to the ER with a fever, thick mucoid rhinorrhea, and wheezing. The patient has an extensive history of sinusitis, otitis media, and recurrent pneumonia. On physical exam, the patient exhibits wheezing and crackles with dullness to percussion on the left side. An A/P chest x-ray is obtained.
Where is the infection?

- A left lung infiltrate is present in this x-ray.

What else is noticed on this x-ray? What condition are these findings associated with?

- This patient has situs inversus. The heart is on the right side, and the liver can be seen pushing the left hemidiaphragm superiorly. The combination of situs inversus and chronic respiratory problems is known as Kartagener Syndrome. Patients with this syndrome exhibit a wide range of problems with ciliary ultrastructure and motility; most commonly due to a reduction in the number of dynein arms. Ciliary dysmotility leads to chronic respiratory infections, infertility, and situs inversus during embryologic development.
Case #5

You are serving on the trauma service at HCMC and a patient arrives unconscious. The paramedics state they found the man face down in an alley. Upon brief visual examination it is noted that the patient has numerous small wounds covering his back, and cut on his scalp. The patient is unarousable and hypotensive. An A/P and lateral chest x-ray are obatined.
Case #5 X-ray

Based on the visual exam of the patient, and lateral chest x-ray, what is the diagnosis?

-The patient was shot in the back with a shotgun. The metal shotgun pellets are embedded in the muscles of his back and in his chest cavity.

What, specifically, is a potential source of hypotension in this patient?

-One or more of the pellets could have injured a vessel in the chest cavity. In particular, the inferior vena cava and aorta are the two largest vessels in the pathway of these pellets.

Should the pellets be removed?

-Only the pellets that are causing symptoms should be removed. The others can stay without consequence. If the pellets are lead, some may argue that they need to be removed to prevent lead toxicity.
Case #6

A 6-mos old child meets with their primary care physician for a well child physical and to schedule an appointment with an orthopedic surgeon to correct a common congenital anomaly. An x-ray is taken as part of the pre-operative preparations.
What is the congenital anomaly?
This patient has bilateral postaxial polydactyly, which is the most common congenital anomaly of the forefoot, occurring in 1.7/1000 live births. Surgical removal of the extra digit by disarticulation is the standard treatment.

In this case, the duplicated 6th toe would be removed, and the broad distal 5th metatarsal would be narrowed.