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Purpose

- Boney pelvis computed tomography (CT) has become a mainstay in the evaluation of pelvic trauma. Frequently radiographs are obtained prior to CT acquisition in the setting of trauma. Radiographs continue to be heavily relied upon for perioperative management and surgical planning. As a result, additional radiographs are frequently obtained shortly after CT acquisition.
- Given the availability of transparent 3D reconstructed CT images which have the potential to replace redundant radiographs, we sought to quantify the prevalence of repeat pelvis and hip radiographs after CT acquisition and its financial impact.

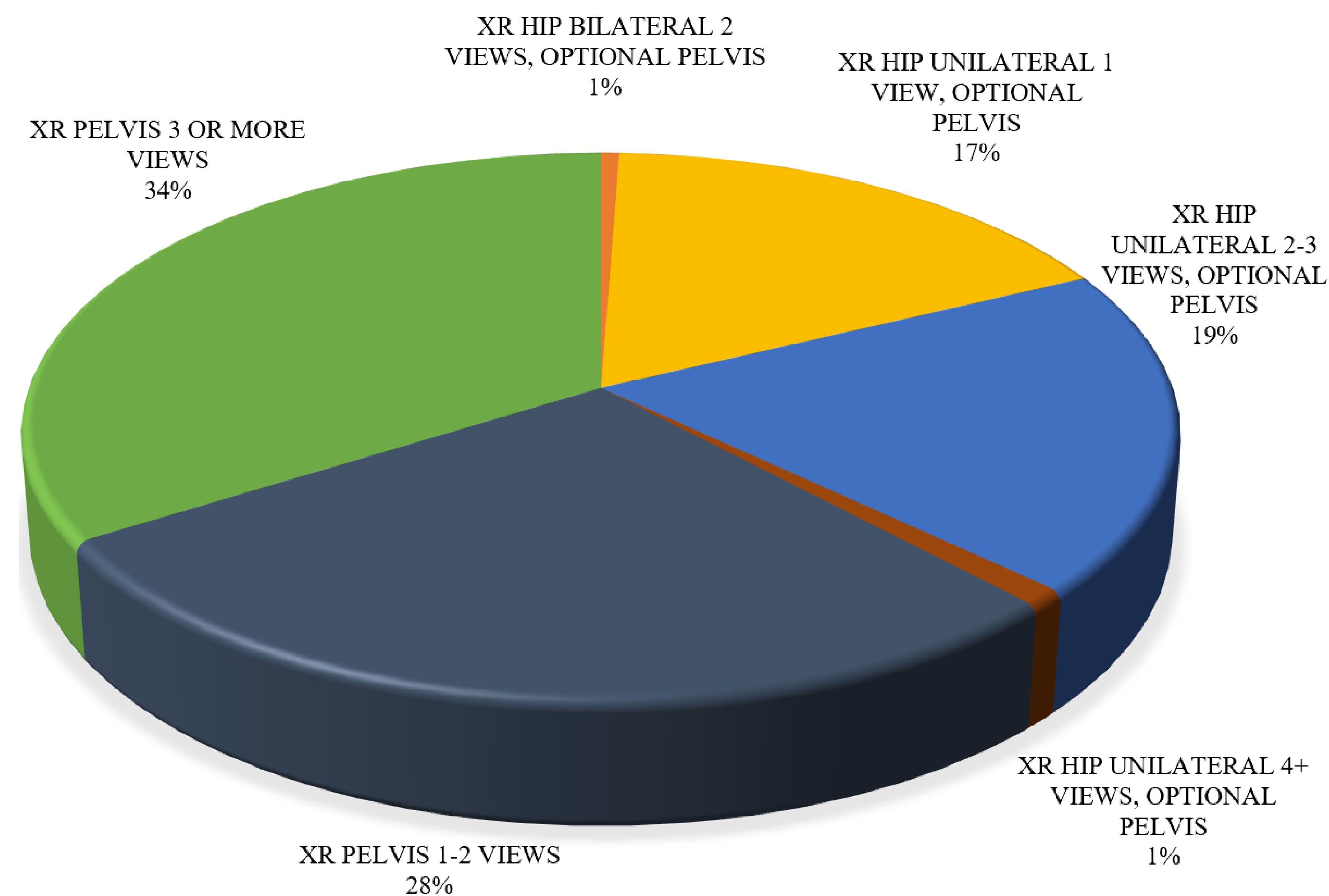
Materials/Methods

- A single-center retrospective review of all patients who underwent boney pelvis CT and subsequently received an additional hip or pelvic radiograph within the 3 days of the CT was performed following IRB exemption.
- Demographics, exam type, and rates of surgical intervention were recorded. Financial analysis was performed using Centers for Medicare & Medicaid Services Physician Fee Schedule data and x-ray technologist labor costs using an average acquisition time of 15 minutes with median hourly wages in our region [1-2].

Results

- Between 4/1/2017 and 4/1/2022, 311 patients were identified who collectively received a total of 510 radiographs of the pelvis or hip(s) within 3 days of receiving a boney pelvis CT.
- 316 (62%) of the studies obtained were pelvic radiographs, and 194 (38%) were hip radiographs. Patients had a median age of 60 years old (range 12-102).
- 173/311 (56%) of patients underwent surgical intervention within 30 days of the CT acquisition.
- The estimated cost based off physician and facility RVU conversions was \$19,432.07 while the estimated x-ray technologist labor cost was \$3,774.00. The estimated total cost of obtaining these redundant radiographs was \$23,206.07.

Prevalence of Radiograph Exam Types



Discussion

- There are many pelvis and hip radiographs performed in the acute setting following recent boney pelvis CT acquisition.
- Reconstructing transparent 3D images of boney pelvis CT scans could reduce the need for repeat radiographs of the pelvis and hip in the acute setting. This could result in significant cost reduction.
- Further efforts should be made to validate the use of transparent 3D reconstruction of CT scans in place of repeat radiographs to mitigate unnecessary imaging.

References

- License for Use of Current Procedural Terminology, Fourth Edition ("Cpt®"). Centers for Medicare & Medicaid Services, <https://www.cms.gov/medicare/physician-fee-schedule>.
- Gregory C. Radiology Technologist Salary Guide. All Allied Health Schools, www.allalliedhealthschools.com/radiology-technician/salary/

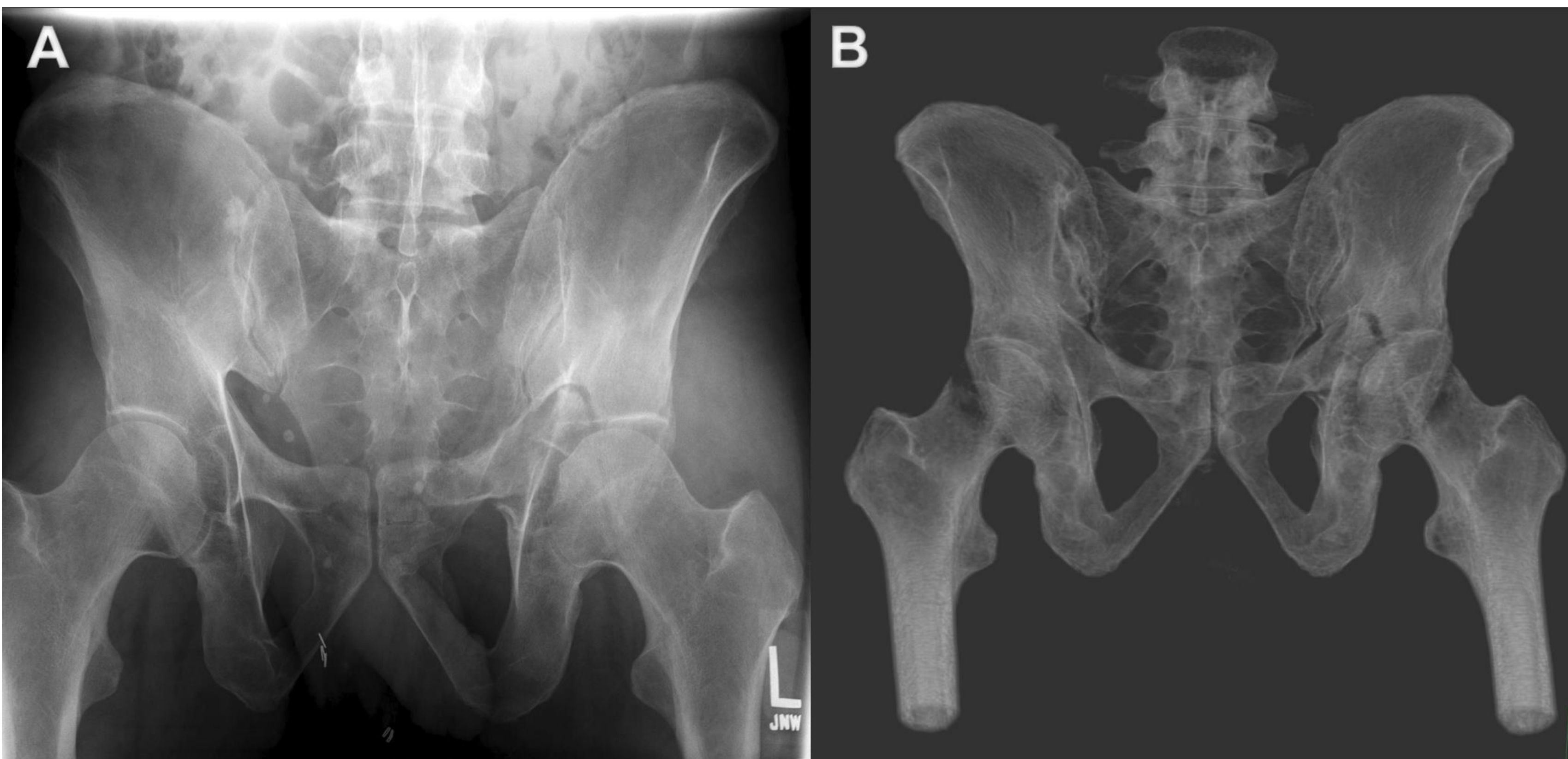


Fig 1. A traditional radiograph of an outlet view of the pelvis (A) and a transparent 3D reconstructed image with a maximum intensity projection (MIP) filter applied (B) in the same patient with a comminuted fracture involving the anterior and posterior columns of the left acetabulum with extension superiorly into the left ilium.

Unnecessary Pelvis/Hip Radiograph Cost Summary

#	Study Type	RVU Cost/Study	Total Physician RVU	Total Facility RVU	Total \$ RVU	Tech Time	Total Cost
3	XR HIP BILAT 2 VIEWS	\$41.87	\$22.84	\$102.78	\$125.62	\$22.20	\$147.82
88	XR HIP UNILAT 1 VIEW	\$32.88	\$548.16	\$2,344.92	\$2,893.08	\$651.20	\$3,544.28
98	XR HIP UNILAT 2-3 VIEWS	\$47.76	\$746.11	\$3,934.03	\$4,680.14	\$725.20	\$5,405.34
5	XR HIP UNILAT 4+ VIEWS	\$60.21	\$46.72	\$254.36	\$301.07	\$37.00	\$338.07
143	XR PELVIS 1-2 VIEWS	\$28.03	\$841.28	\$3,167.16	\$4,008.44	\$1,058.20	\$5,066.64
173	XR PELVIS 3+ VIEWS	\$42.91	\$1,496.72	\$5,927.00	\$7,423.72	\$1,280.20	\$8,703.92
510			\$3,701.83	\$15,730.25	\$19,432.07	\$3,774.00	\$23,206.07