


# EXCESSIVE USE OF RADIOGRAPHS AT THE RADIOLOGY EMERGENCY DEPARTMENT

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# Introduction



- **Crowding** at the Radiology Lab of a Hospital's Emergency Department (ED) is a well-known situation which is thought to be attributed to the excessive amount of radiographs the non-urgent patients are referred for.
- The scope of this research was to register and study the **non-urgent** patients coming to Hippokratio Hospital and the doses they receive in association with the diagnostic value of their radiographs.

# Method



- Patient's data (gender, age, onset of symptoms, clinical findings, referring specialties, number & type of radiographs) were recorded for non-urgent ambulatory adult patients.
- Effective doses were calculated
- For each patient an index of the **exam's diagnostic value (DVI)** was assigned which was the ratio of the dose of his radiographs that had positive findings to the total dose from all the radiographs he/she was referred to.

# Results



- A total of 400 non-urgent ambulatory patients were investigated with a total of 732 radiographs taken (average **1.83 radiographs per patient**).
- The majority were Chest PA (32.5%), Abdomen (8.5%) and Knee AP\*Lat (6.0%) radiographs.
- Most usual diagnosis: injuries (39%), abdominal pain (18%), respiratory infection (15%), chest & cardiovascular problems (11%), neck/low-back pain (10%)
- **78%** of the radiographs had **no clinical findings** (average **DVI: 0.26**)

# Results



- **Women** were referred for fewer radiographs than men.
- Patients having **symptoms for more than a week** were referred for fewer radiographs than those with recent symptoms.

# Results



## Limb injuries

- The most often cause for ED use (24.3% of ED patients).
- Average number of radiographs per patient: 2.5.
- Average **DVI: 0.18** (the majority of Ankle, Knee, and Foot radiographs were **negative**).
- Referring ED clinicians: Orthopedists, Surgeons.

# Results



## Abdominal pain

- The second most often cause for ED use (17.8%).
- Average patient dose: 535  $\mu\text{Sv}$ .
- ED Pathologists referred for more radiographs (1.5 per patient) than Surgeons and Urologists, most of them being negative (**DVI: 0.18**).

# Results



## Neck / Low-back pain

- Average DVI: 0.55 (more than half of radiographs were positive).
- Most patients had symptoms more than a week before: **inappropriate ED use**.
- Referring ED clinicians: Orthopedists.



# Results



## Annual Collective Dose

- Total of all patients: **2.61 manSv**
- Abdominal pain patients: 1.55 manSv
- Neck/Low-back pain patients: 0.26 manSv
- Limb injuries patients: 0.01 manSv
- Head & torso injuries patients: 0.38 manSv
- Respiratory infection patients: 0.08 manSv
- Chest pain & cardiovascular problem patients: 0.06 manSv
- Other: 0.27 manSv

# Conclusions



- The number of radiographs **could be decreased** in the case of **limb injuries, abdominal pain and neck/low-back pain ED patients** after a more detailed **clinical evaluation** and **implementation of referral criteria** by the ED clinicians.
- The outcome would be a **reduction** in **individual and collective dose, crowding** and **cost** for the Radiology ED.