

An imaging physicist's perspective: Volunteering in underserved regions

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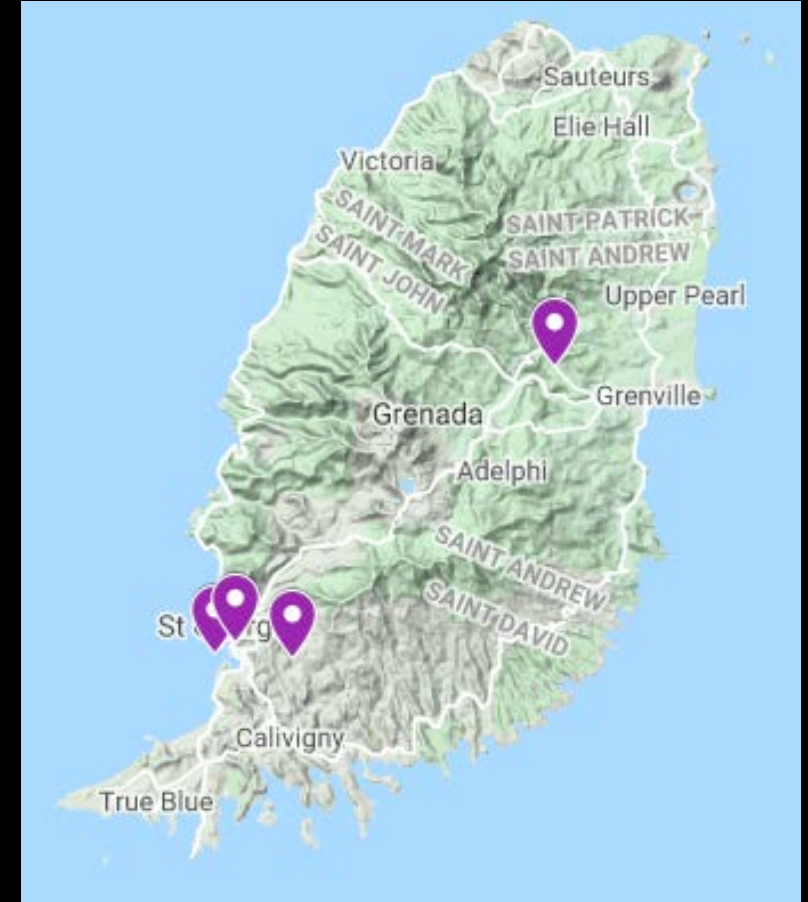
Physics efforts

- Puebla, Mexico



Physics efforts

- Grenada
 - Grenada General Hospital
 - Princess Alice Hospital
 - Spice Isle Imaging Center
 - St. Augustine's Medical Services



General Hospital

- Available equipment
 - GE Proteus (x-ray)
 - GE Precision (RF)
 - Mammography
 - Konica CR reader
 - Film processor
- Radiation safety
 - Mirion Instadose
- Biomedical Engineering
- New construction



Princess Alice

- Available equipment
 - GE XR 6000 (x-ray)
 - Agfa CR 15-X reader



Spice Isle Imaging Center

- Available equipment
 - Philips Optimus
 - Fuji ClearView CR reader
 - GE Senographe 800
 - GE Lightspeed 16
 - GE Signa Profile 0.2 T MRI
- Radiation safety
 - Mirion Instadose
- Biomedical Engineering



St. Augustine's Medical Services

- Available equipment
 - Fischer DR retrofit
 - Toshiba Aquillion 64 CT



- Morocco
 - University Mohammed V Ibn Sina Hospital
 - Medical caravan



Main hospital in Rabat

- Emergency Department
 - 3 CR x-ray systems
 - Siemens CT
 - MRI
 - US



Medical caravans

- DR x-ray system
- Dental x-ray
- US (on loan from main hospital)



Challenges

- Functionality of equipment
- Radiation safety concerns
- Limited resources



Broken equipment



General Hospital

- Available equipment
 - GE Proteus (x-ray)
 - GE Precision (RF)
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Spice Isle Imaging Center

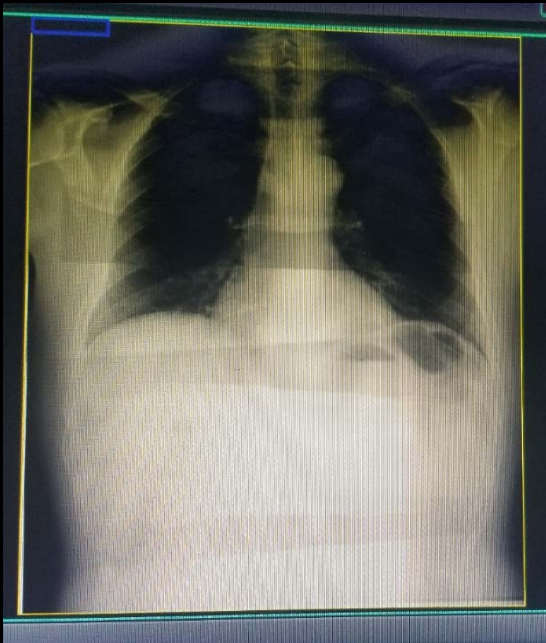
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Main hospital in Rabat

- Emergency Department
 - → 2 CR x-ray systems
 - Siemens CT
 - MRI
 - US

- Improper film processing
- Waiting for recalibration for over a month
- Mammography compression paddle deflection was well above limit
- Light field to x-ray field misalignment



Challenges

- Functionality of equipment
- Radiation safety concerns
- Limited resources



Fluoroscopy room

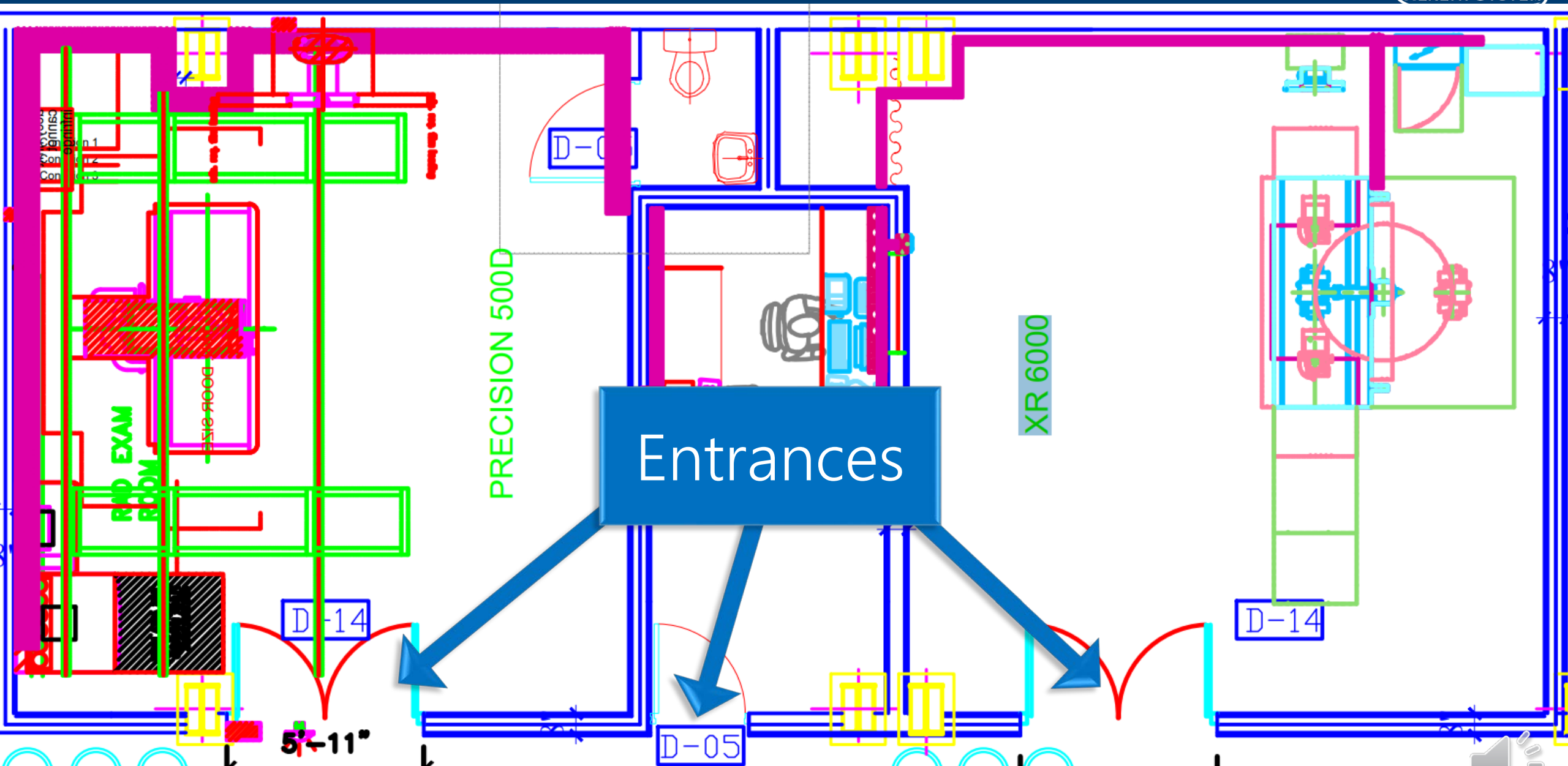
Control
room

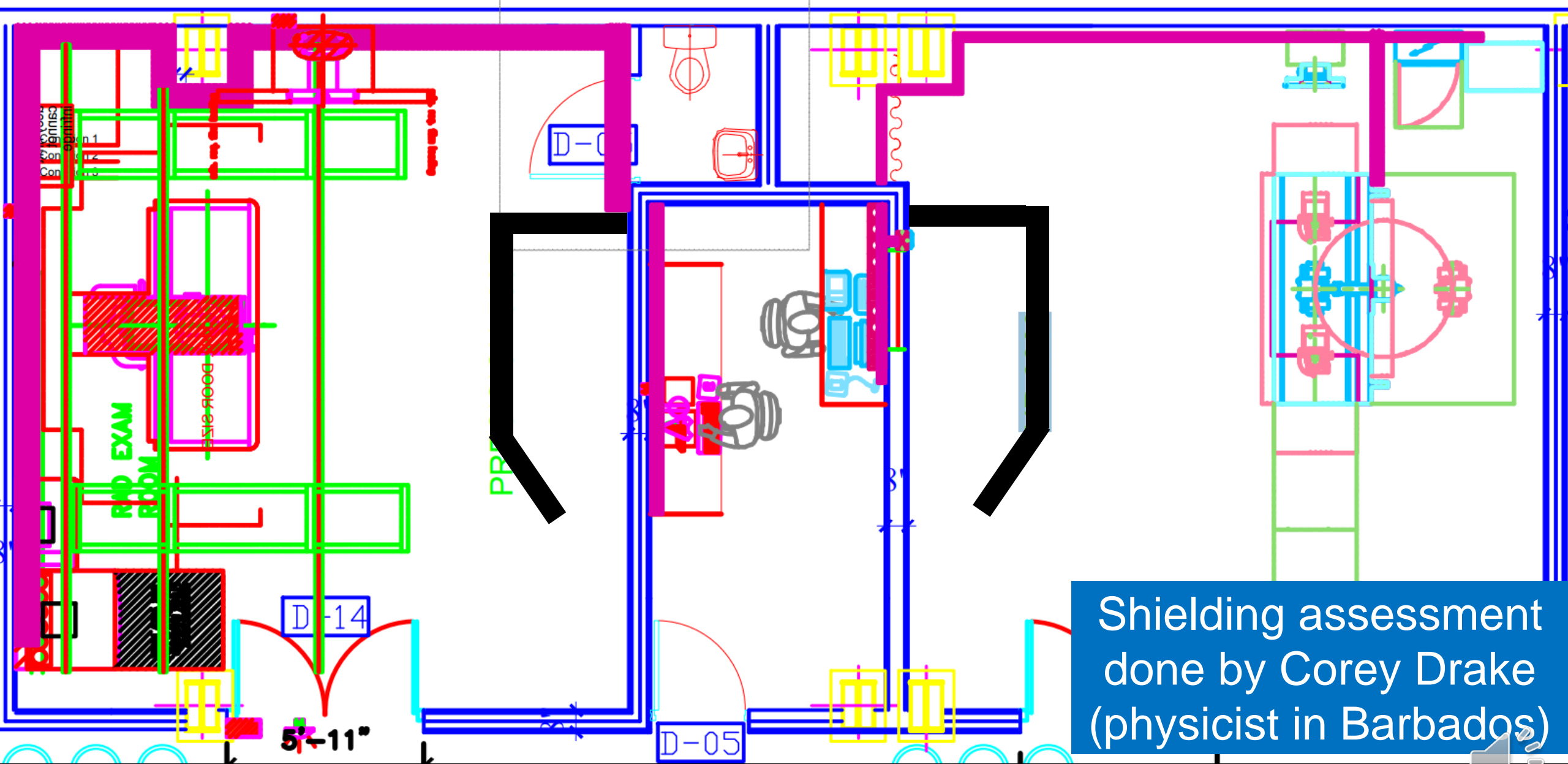
Radiography room

5'-11"

D-05







Shielding concerns

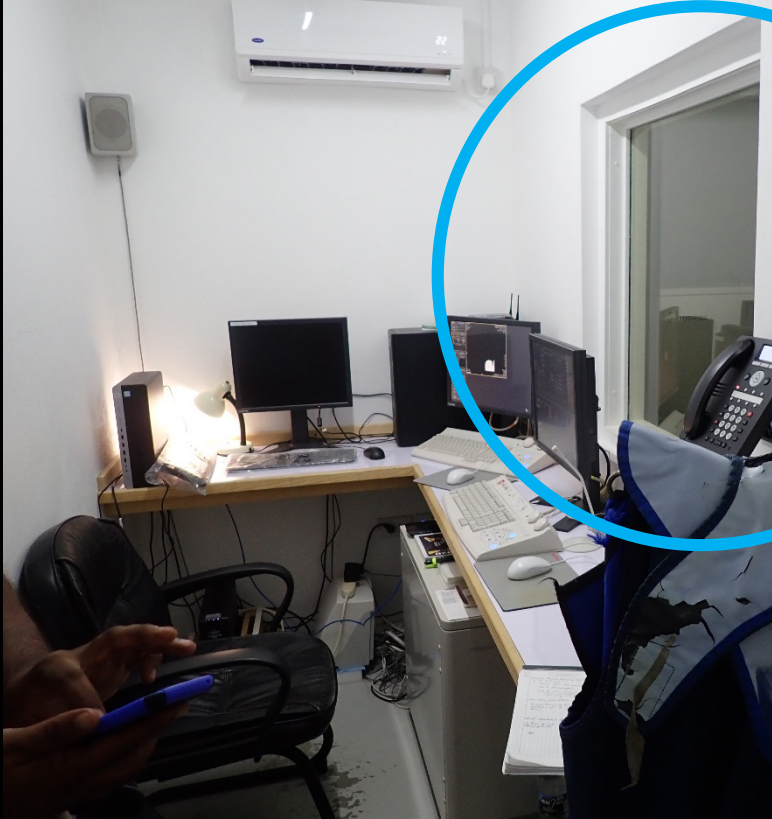
Control
room

CT
room



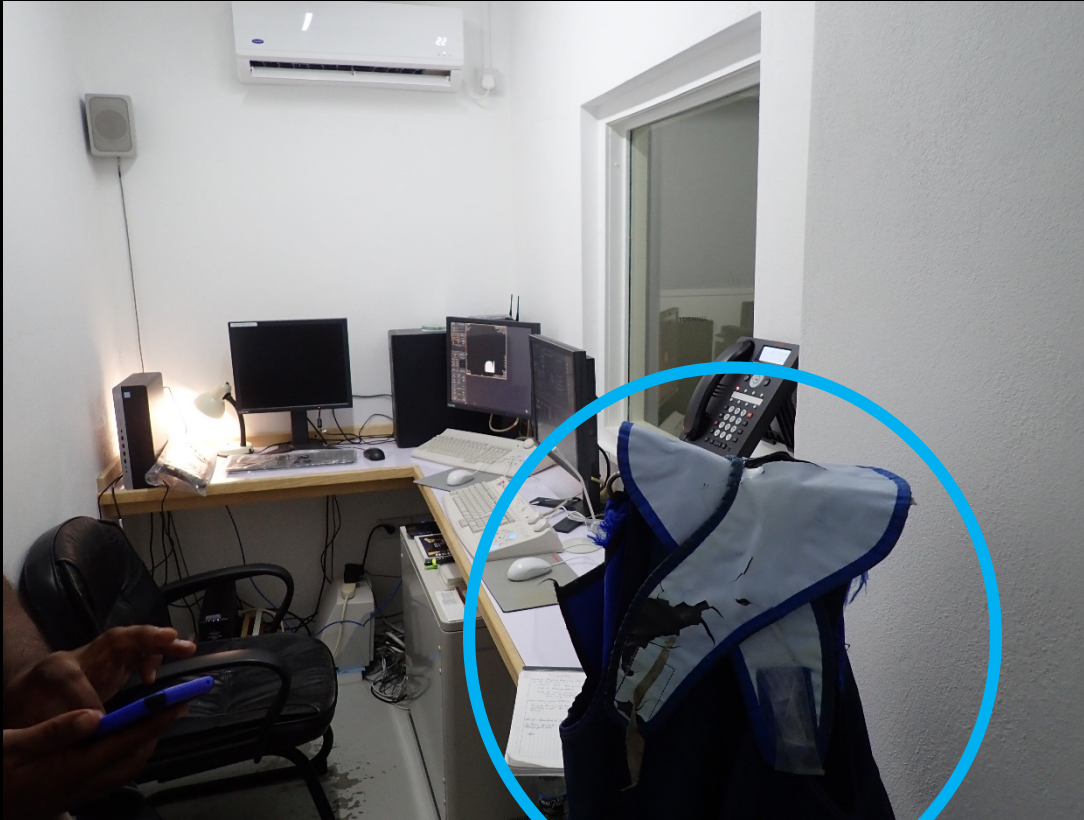
Shielding concerns

Control room



Shielding concerns

Control room



CT room



Shielding concerns



Dosimeter use



Other environmental concerns

- Illuminance in reading rooms and luminance from viewboxes in Puebla
- Ambient lighting in Morocco



Challenges

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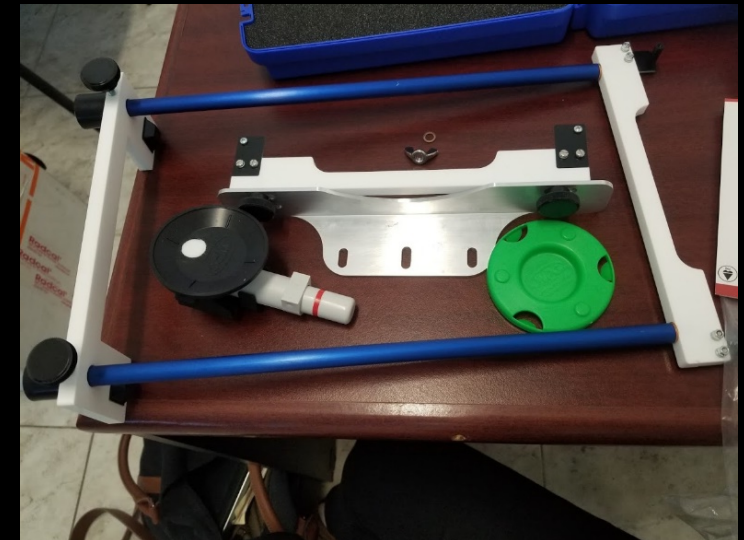
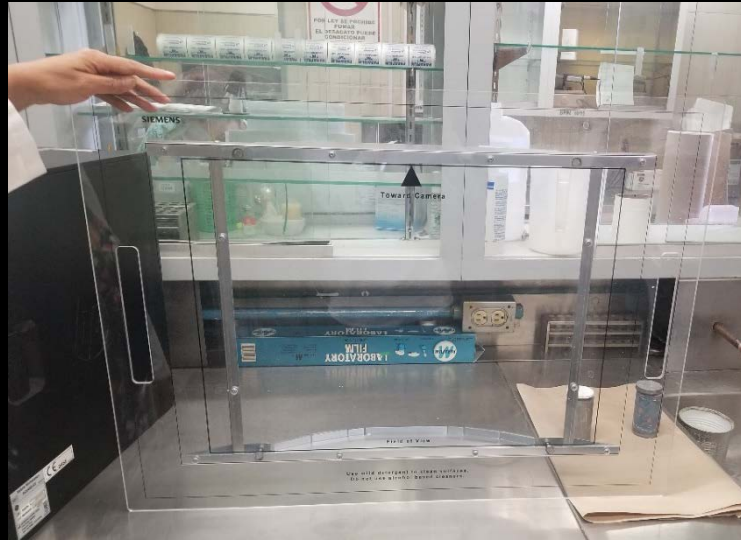


Equipment testing

- June 2018: Tested doses on radiography, mammography, dental, CT, fluoroscopy



Physics equipment



- Same techniques used for every patient in Morocco and Puebla
- No collimation used in wall Bucky exposures
- Some techs don't collimate in Grenada



Lack of trained personnel

- Pediatric and adult head CTDI
- Establish diagnostic reference levels
- Repeat/reject rates
- Patient dosimetry
- Variable dose reporting in CT



- Success requires fostering ongoing relationships with sites and site personnel
- Progress requires diverse mix of physicists
 - Educational backgrounds
 - Experience
 - Race, ethnicity, culture
- Improvements are incremental
- Approach to issues is different than our normal practice
- Pandemic has shifted focus to remote learning



Acknowledgments

- Tim Blackburn
- Ashley Rubinstein





Thank you

