

The background is a complex watercolor composition. It features large, soft-edged washes of color in shades of blue, orange, red, and grey. Interspersed throughout are smaller, more defined shapes, including circles and elongated forms, some of which have a textured, almost crystalline appearance. The overall effect is artistic and layered, with colors overlapping and blending into each other.

C18

The Importance of Clinical Imaging Protocols Within Healthcare



Objectives

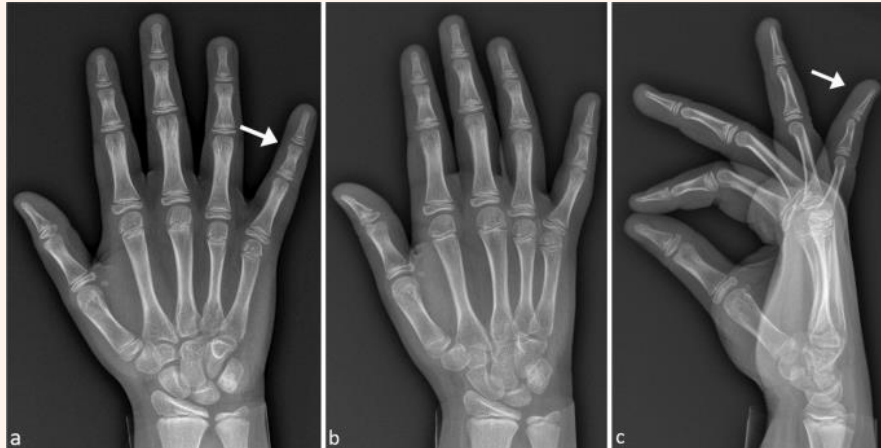
- Define “Imaging protocols”
- Understand the importance of ordering the correct protocol
- Outline the potential risks associated with ordering the incorrect protocol
- Discuss the importance of dose awareness in a trauma/emergency situation
- Understand the impact that incorrect ordering can have on radiology workflow
- List potential education opportunities and solutions for ordering providers



What is an Imaging Protocol?

A protocol is a preset group of images decided by a Radiologist that will show the part in multiple positions. This group of positions is used to determine a diagnosis.

Protocols differ between radiologists, hospitals, and ordering providers. They also can differ depending on the patient. Imaging ordered in a trauma situation may have a shortened or streamlined protocol compared to orders in an outpatient setting.



Let's look at some examples...

Hand Protocol	Knee Protocol	Elbow Protocol	C-Spine Protocol
AP, Oblique, Lateral	AP, Lateral Or AP, Lateral, Sunrise Or AP, Lateral, Sunrise, Rosenberg (Tunnel View)	AP, Lateral Or AP, Internal Oblique, External Oblique, Lateral	AP, Lateral Or AP, Lateral, Flexion, Extension Or AP, Lateral, Obliques, Flexion, Extension, Odontoid

The options are endless...

Each hospital has its own set of protocols, so the options for which images are requested is basically infinite. Each radiologist has their own preferences for which images they think best serve the patient.

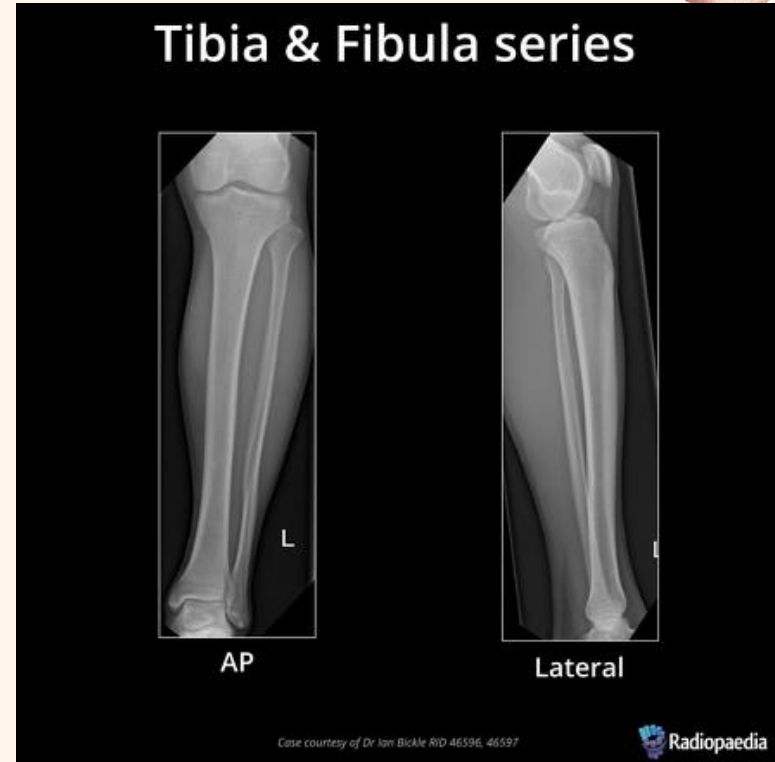
The issues come into play when the ordering provider and the radiologist are not on the same page about what images will best benefit the patient.



Why would a protocol be ordered wrong?

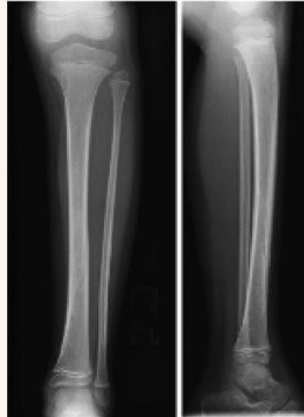
There are many reasons that a protocol could be ordered incorrectly...

- **Accidental** ordering of wrong side/area
- **Patient** not telling provider exactly what hurts
- **Provider** misunderstanding what the images specifically look at
- **Over-ordering** of same anatomy



A common example...

If a patient is having lower leg pain, the provider may order knee, tibia/fibula, and ankle x-rays to properly survey the area. However, this order contains many duplicate unnecessary images and does not serve the patient. Instead, the provider should only order tibia/fibula x-rays if the injury does not involve the knee/ankle specifically. The same anatomy will be shown at lower cost and dose to the patient.





What's the big deal?

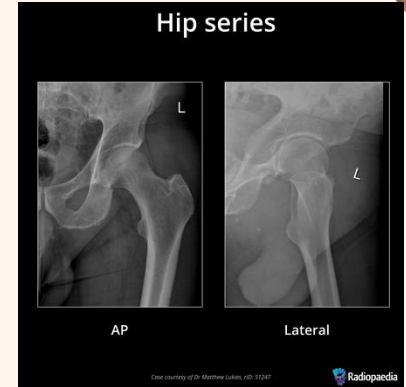
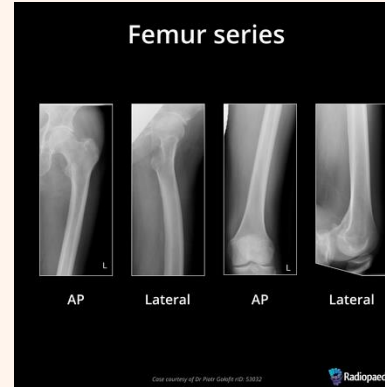
There are many issues that arise due to incorrect ordering...

- ❖ Increased **dose** to patient
- ❖ Increased **time** per patient
- ❖ Disruption in workflows- departments **get behind** trying to fix ordering errors
- ❖ Increased **cost** to the patient
- ❖ Decreased patient **satisfaction**
- ❖ Increased **pain/discomfort** to patient from manipulating body into different positions
- ❖ Increased overall **workplace stress**



Patient dose to radiation

- ❖ While radiation dose the patient receives from a standard diagnostic x-ray is relatively low, one of our main priorities is to protect the patient as much as possible.
- ❖ To keep the patient dose as low as reasonably possible, this may mean having to adjust or change orders as a whole.
- ❖ Incorrect orders could mean doubling or even tripling patient dose if not corrected.
- ❖ For example, if a patient has a right femur laceration and a 2-view right hip, 4-view femur, and 2-view knee is ordered, that is 4 additional exposures that are already seen on the 4-view femur.
- ❖ This is doubling the patient dose, and that is not including the very common occurrence of having to repeat an image due to artifact or incorrect positioning.



Shown in the images above and to the right are 4-view femur, 2-view hip, and 2-view knee series. As you can see many of these views repeat each other

Disruption in workflow

One of the most important aspects of a productive department is the ability to work together and follow the workflow.

The average workflow for any Imaging department is as follows:

- ❖ Get patient's x-ray order, confirm order is logical, prepare room and x-ray panel, get patient, verify name, date of birth, and part(s) to be imaged, perform imaging, return patient, tidy room, and send image(s)
- ❖ One of the places the workflow can get disrupted is confirming the x-ray order is logical
 - If the order does not make sense (ex. A knee, tibia/fibula, and ankle x-rays all ordered on the left side) the technologist must then stop what they are doing, contact the ordering physician, explain the problem, and try to correct the imaging order, all before grabbing the patient
- ❖ Another part, is verifying with the patient which body part(s) to be imaged
 - This is caused by a variety of reasons, normally due to lack of communication
 - The process of fixing it is similar, having to contact the ordering physician, explaining the situation and trying to correct the order
 - While this is happening the patient is waiting in the exam room, greatly lengthening the exam time, and overall decreasing patient satisfaction



Decrease in patient satisfaction

When patients come to have imaging done, they are given an estimate for how long the exam will take. Many of these patients will have appointments with their providers, lab work, or other arrangements after their imaging appointment.

When exams are ordered improperly, it is very easy for the exam to run late. Getting a hold of providers is harder than it may seem, and this can cause disruption in the workflow as well as the patients' plans.

Over-ordering also may cause the patient more discomfort than necessary. Acquiring images usually requires the body part to be manipulated in some way, and this is usually uncomfortable for patients. Increased orders means more movement and more pain for the patient.



Increased costs

- ❖ Each exam performed has its own cost attached to it, which is then billed to the patient at a later date
 - The patients themselves do not have a concept of what images needed, they receive what the ordering provider ordered.
 - When an excessive amount of images are ordered (when not needed), it not only results in more radiation to the patient but also increased costs to them as well.
- ❖ Performing an adequate amount of x-rays not only takes a toll on technologists but also the x-ray tubes as well
 - When taking a plethora of x-rays that may not be needed it is very hard on the tube itself, which may lead to more repair costs on the machine and software.



Increased workplace stress

While, at times, stress is impossible to avoid, it is important to try and reduce workplace stress as much as possible. Decreased stress often times increases productivity, healthy work-home balance, and overall happier employees.

- ❖ When an added stressor like having to constantly change and correct orders in an already busy work environment, it is bound to:
 - Slow down the workflow
 - Decrease patient satisfaction due to a longer wait time
 - Decreased physician satisfaction because they are getting contacted more frequently by the Imaging Departments, and having to wait longer for quality imaging to be completed


When Technologists are constantly having to change and correct orders, it puts them behind schedule, causing an overall decrease in satisfaction, an added pressure to move quicker with patients, and often causing more repeats or opportunity for mistakes





Education

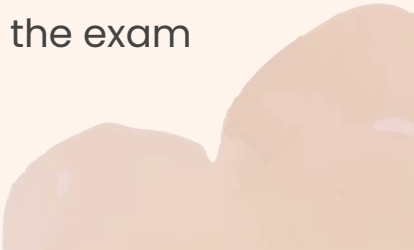


- ❖ In a study, only **39%** of residents reported that radiation safety was mentioned in their program every 6 months (Sadigh et. al, 2014).
 - ❖ The role of education is crucial throughout the medical field but plays an important role within radiology
 - With furthering education on ordering protocols/exams radiology departments' efficiency rates have potential of climbing
 - Not only would this benefit technologists but also, ordering providers, physicians, nurse practitioners, physician assistants and so many more
 - ❖ Further Education can be conducted in a variety of ways, some of these may include:
 - Daily team huddles
 - Zoom meetings
 - Monthly conferences
- 



How to respond to an incorrect order



- ❖ Double check you have the **correct patient**
 - ❖ **Take a second look** at the order and confirm with the patient what side and/or part is bothering the patient
 - ❖ Once the order is confirmed to be wrong **explain to the patient the situation** and make contact with the ordering physician (call/vocera/in-person if possible)
 - ❖ **Explain the situation to the physician** (patient name/ID number, how the order is incorrect, what part the patient is stating needs to be imaged instead)
 - ❖ After explaining the situation, **confirm with the physician that you can correct the order** (verbally or written) or if they are able to correct the order
 - ❖ Throughout the process **check on the patient**
 - ❖ After the order is properly corrected, **go forward** with performing the exam on the correct part/side
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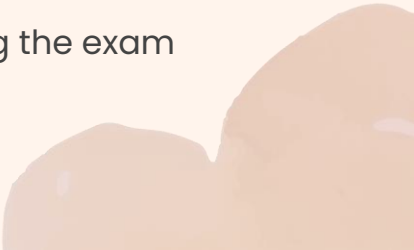


Our role as the Technologist



As a Technologist, we have many roles and responsibilities, one of the biggest is keeping our patients safe. From grabbing the imaging order to imaging the patient to sending the images and cleaning the room, its for the overall benefit of the patient.

The overall role of a technologist is as follows:

- ❖ **Analyze imaging orders** prior to grabbing a patient to make sure what is ordered makes sense, and eliminate unnecessary or repeated views
 - ❖ **Set up** the room properly and make sure the monitor is prepared
 - ❖ **Safely position the patient** and confirm their identity and body part(s) to be imaged
 - ❖ **Help the patient** in anyway they may need, moving to the exam table, standing up or sitting down, moving a body part or removing things that may show up as an artifact
 - ❖ Once the imaging is completed safely and timely, **return the patient** either to the waiting room or appointment
 - ❖ **Properly send images and sanitize** the exam room and things used during the exam (sponges, sandbags, etc.)
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Advocating for the patient

Often times, as technologists we are some of the first people to see patients, whether that is in inpatient or outpatient areas. It is our duty to make sure patients feel seen, heard, and safe.

Some of the best ways to do that are to listen to the patient and try not to rush them, take things at their pace, and be willing to work with them and their needs

If an order is wrong (wrong side/part) make sure to not make the patient feel like they are at fault for this mix-up. Explain the situation to them and what you have to do next,

don't just leave them in the exam room waiting without an explanation.

When it comes to switching the order to the correct side and/or part, make sure to also explain to the physician, be firm and be there for your patient. The key to advocating for your patient is communication.



Conclusions

- We as technologists have a responsibility to advocate for our patients and promote radiation safety
- Medical professionals as a whole need to be more aware of imaging orders for safety reasons, as well as workflow reasons
- Further education should be provided and easily accessible for those who are responsible for ordering imaging
- Correct ordering is advantageous for the patient, technologist, and ordering providers!



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