Great Plains Health

2019 NHA Quest for Excellence

Imaging Efficiently-
Diagnostic Imaging Utilization

Process of Identifying Need

- The bill for health care in the US estimated at $2.9 trillion, or 19% of the gross domestic product (2013 estimation)[1]
- An estimated 30% of these costs are unnecessary, one-half of which may be generated by physicians[2]
- Patients with multiple high-end imaging annually
  - Concern for exposure related malignancy and acute kidney injury[3]

1. Centers for Medicare and Medicaid Services. National Health Expenditures 2013 Highlights. Available at: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/downloads/highlights.pdf. Accessed February 1, 2015.

2. Committee on the Learning Health Care System in America; Institute of Medicine. in: M. Smith, R. Saunders, L. Stuckhardt, (Eds.) Best Care at Lower Cost: The Path to Continuously Learning Health Care in America. National Academies Press, Washington, DC; 2013

3. Litkowski, P., Smetana, G., Zeidel, M., & Blanchard, M. (2016). Curbing the urge to image. Retrieved 4 August 2019, from https://www.amjmed.com/article/S0002-9343(16)30680-5/fulltext

PDSA Implementation Team

- Radiologists
- Emergency Medicine Physicians
- Family Practice Physicians
- Hospitalists
- Specialty Physicians
- CIN Leadership
- GPH Senior Leadership

Educational Tool

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IMAGING EFFICIENTLY

It's not that you can't order anything, just don't order everything....L2 MD ™

CHRONIC HEADACHE W/O CHANGE
No Imaging Required

CHRONIC HEADACHE WITH CHANGE
Headaches with an associated new clinical symptom or sign
Best Option: MRI With and Without Contrast
Second Option: CT Head without Contrast

ACUTE HEADACHE - "Worst Headache of My Life"
Headaches of severe acute onset with concern for intracranial hemorrhage/aneurysm
Best Option: CTA of the brain (At GPH this will also include a non-contrasted head CT)
Second Option: MRI

CVA
Acute setting (ER): CT head +/- CTA Particularly if patient is potential candidate for tPA
Subacute setting: MRI with and without contrast
This can be followed by MRA of the head and neck with and without contrast
The key is to avoid doing both, or even a third modality (carotid duplex)

GENERALIZED ABDOMINAL PAIN
Best Option: CT abdomen and pelvis with contrast and pelvis with contrast
- CT abdomen and pelvis without contrast if renal insufficiency is present or allergic
- If acute cholecystitis is seen on CT should not have to perform follow-up Ultrasound
- If pregnant consider Ultrasound before CT

RUQ ABDOMINAL PAIN
Best Option: US Abdomen of the RUQ.
- HIDA should be performed on inpatients and only if US is equivocal

CHF WITHOUT ACUTE ISCHEMIA
Best Option: Echocardiography
Second Option: Chest X-ray 1 or 2 view, but if not in ICU/CCU do not order daily

CHF EXACERBATION
Best Option: Chest x-ray, one or two views
- If clinical factors (acute aortic disease, pulmonary emboli): CT Chest

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BACK PAIN W/O ACUTE CHANGE
No Imaging Required

BACK PAIN WITH ACUTE CHANGE DUE TO TRAUMA
- Radiographs can be considered especially in the setting of osteoporosis
- CT should be considered if radiographs negative and there is persistent concern for vertebral fracture
- MRI should be considered if concomitant disc and ligamentous injury is suspected

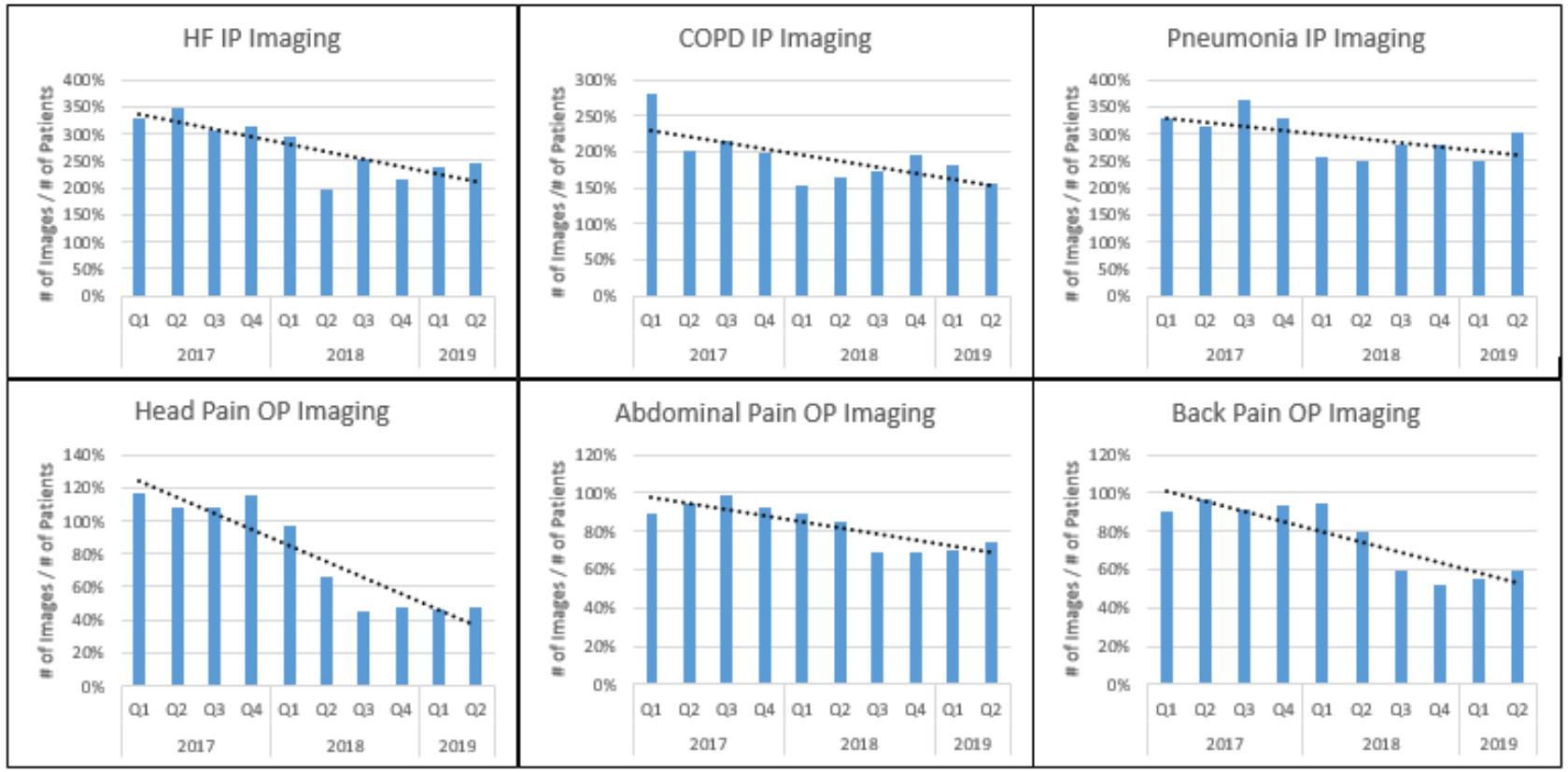
BACK PAIN WITH ACUTE CHANGE DUE TO INFECTION OR MALIGNANCY
Best Option: MRI with and without Contrast
Second Option: CT should be considered if MRI is not possible

BACK PAIN WITHOUT IMPROVEMENT FOLLOWING PHYSICAL THERAPY
Best Option: MRI without Contrast
- CT should be considered if MRI is not possible. This would include with or without IV contrast
- CT myelography is ranked dead last in appropriateness particularly if patient can have an MRI exam
- In some institutions CT following spinal fusion will be ordered to confirm fusion and incorporation of bone graft

COPD EXACERBATION WITH OR WITHOUT FEVER
Best Option: Chest X-Ray 2 Views
- If no resolution following appropriate therapy, then CT chest with or without contrast

COMMUNITY AQUIRED PNEUMONIA
Best Option: Chest X-Ray 2 Views
- If no resolution following appropriate therapy, then CT chest with or without contrast

Results



Notes:

- Each graph is calculated based on all patients with the indicated condition as determined by the patients DRG (for Inpatients) or Primary ICD10 Dx (for Outpatients)
- See Appendix A for list of MSDRGs and ICD10 DX codes used for each graph
- Images counted include X-Ray, CT, MRI and Ultrasound
- Calculation: # of Images divided by # of patients.
    - Some patients have more than one image, therefore result can be greater than 100%.
        - For example: One patient that received three images would show a result of 300%

Results

Diagnostic Imaging Utilization Trend – Appendix A

MSDRGs Used for Heart Failure Analysis:

291	Heart Failure Shock w MCC
292	Heart Failure and Shock w MCC
189	Pulmonary Edema Respiratory Failure

MSDRGs Used for COPD Analysis:

190	Chronic Obstructive Pulmonary Disease w MCC
191	Chronic Obstructive Pulmonary Disease w CC
192	Chronic Obstructive Pulmonary Disease w/o CC/MCC
202	Bronchitis Asthma w CC/MCC
203	Bronchitis Asthma w/o CC/MCC

MSDRGs Used for Pneumonia Analysis:

193	Simple Pneumonia Pleurisy w MCC
194	Simple Pneumonia Pleurisy w CC
195	Simple Pneumonia Pleurisy w/o CC/MCC
177	Respiratory Infections Inflammations w MCC
178	Respiratory Infections Inflammations w CC

ICD10DX Codes used for Head Analysis:

G43.709	Chronic Migraine w/o Aura, Not Intractable, w/o Stat Migr
G43.909	Migraine, Unsp, Not intractable, w/o Status Migrainosus
G44.52	New Daily Persistent Headache (NDPH)
G45.9	Transient Cerebral Ischemic Attack, Unspecified
I63.9	Cerebral Infarction, Unspecified
R41.82	Altered Mental Status, Unspecified
R42	Dizziness and Giddiness
R51	Headache
R55	Syncope and Collapse

ICD10DX Codes used for Abdominal Analysis:

R10.9	Unspecified Abdominal Pain
R10.31	Right Lower Quadrant Pain
R10.84	Generalized Abdominal Pain
K52.9	Noninfective Gastroenteritis and Colitis, Unspecified
R10.11	Right Upper Quadrant Pain

ICD10DX Codes used for Back Analysis:

M48.02	Spinal Stenosis, Cervical Region
M48.06	Spinal Stenosis, Lumbar Region
M51.16	Intervertebral Disc Disorders W Radiculopathy, Lumbar Region
M51.26	Other Intervertebral Disc Displacement, Lumbar Region
M54.12	Radiculopathy, Cervical Region
M54.16	Radiculopathy, Lumbar Region
M54.2	Cervicalgia
M54.40	Lumbago with Sciatica, Unspecified Side
M54.42	Lumbago with Sciatica, Left Side
M54.5	Low Back Pain
M54.6	Pain in Thoracic Spine
M54.9	Dorsalgia, Unspecified
S16.1XXA	Strain of Muscle, Fascia and Tendon at Neck Level, Initial
S39.012A	Strain of Muscle, Fascia and Tendon of Lower Back, Initial

Data Source: EPSi - Outpatients January to December 2017

Lessons Learned

- Success related to Physician participation and Physician led initiative
- Concurrent implementation of enterprise EMR assisted with more providers utilizing one EMR
- Creating top 6 diagnosis assisted to provide team with initiative parameters
- Senior Leadership and GPHIN Board Support of initiative assisted with success

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