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nerve palsy (n=15, 2.8%), stroke (n=13, 2.4%), ruptured globe (n=12, 2.2%), malignancy (n=11, 2.1%), idiopathic intracranial hypertension (n=11, 2.1%), diplopia (n=10, 1.9%), visual loss (n=9, 1.7%), amaurosis fugax (n=5, 0.9%), optic nerve disorder (n=4, 0.7%), retrobulbar hemorrhage (n=4, 0.7%), abscess (n=3, 0.6%), eye problem (n=3, 0.6%), eye swelling (n=2, 0.4%), giant cell arteritis (n=2, 0.4%), retinal artery branch occlusion (n=2, 0.4%), and strabismus (n=2, 0.4%) received necessary advanced neuroimaging. All patients with final diagnoses of conjunctivitis (n=11, 2.1%), retinal detachment (n=7, 1.3%), cataract (n=4, 0.7%), acute angle closure glaucoma (n=3, 0.6%), hordeolum (n=3, 0.6%), dacryocystitis (n=2, 0.4%), floaters (n=2, 0.4%), uveitis (n=2, 0.4%), vitreous detachment (n=2, 0.4%), and zoster ophthalmicus (n=2, 0.4%) received unnecessary advanced neuroimaging. Eighty-one percent (n=435) of patients underwent CT only, 14.9% (n=65) underwent MRI only, and 6.7% (n=36) underwent both. Sixty-two percent (n=330) of patients were discharged from the ED, 37.5% (n=201) were admitted, 0.7% (n=4) left against medical advice, and 0.2% (n=1) placed in observation.

**Conclusions:** Of various ocular emergencies in which advanced neuroimaging was not required, conjunctivitis and retinal detachment were the most common causes of unnecessary imaging. Imaging was necessary for most patients with final diagnoses of trauma and neurologic disorders. CT was the most common type of imaging modality performed.

## 381 It's a Hard Knock Life: How Kids With Mild Traumatic Brain Injuries Are Treated

Krishnan K, Su A, Long C/Loyola University Chicago Stritch School of Medicine, Maywood, IL

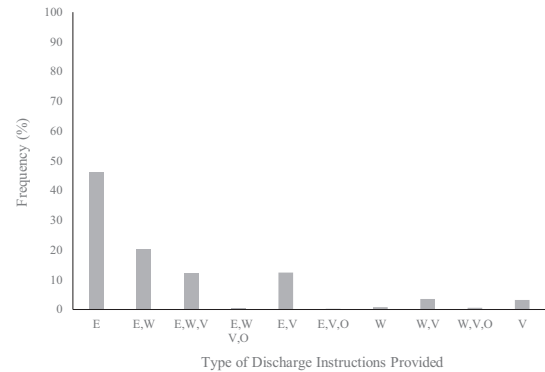


**Study Objectives:** The diagnosis and treatment of mild traumatic brain injuries (mTBI) by physicians in the emergency department (ED) is greatly varied. Due to the frequency and long term consequences associated with pediatric head injuries, it is crucial that adequate counseling is provided in acute care settings along with uniform terminology for understanding. Currently, at many institutions including Loyola University Medical Center (LUMC), there are no uniform guidelines set in place for the treatment of mTBI in pediatric patients in the ED. The purpose of our study is to evaluate existing practices at LUMC ED in order to address inconsistencies in diagnostic or discharge practices for the implementation of future quality improvement measures.

**Methods:** A retrospective cohort study was conducted at LUMC of pediatric patient records from 2017 to 2020 for patients presenting with mTBI. A total of 1,160 patients aged 2 to 18 met inclusion criteria for analysis. Demographic, diagnostic, and treatment data were summarized, and Pearson's chi squared tests and Fisher's exact tests were performed to determine associations among patient characteristics and provider practices.

**Results:** The common etiologies of injury included sports related contact injuries (24.7%) and falls (20.1%). In terms of evaluation, physicians did not uniformly use existing criteria such as PECARN to determine if CT scans were needed (31.6% did not use). However, there was correlation of utilizing this diagnostic tool with fall-related injuries compared to other injury types (39.5%,  $p < 0.001$ ). Regarding treatment, discharge instructions were predominantly based on a generalized template on Epic (91.9%), with a minority of physicians providing additional specific instructions to the patient through written, verbal, or additional supplemental material. The most common formats included Epic only (46.1%), Epic and personalized written instructions (20.2%), and Epic and verbal instructions (12.4%). When provided, specific instructions were correlated with the injuries involving motor vehicles accidents ( $p = 0.001$ ). Instructions for follow-up within 3 months of ED visit were provided to 93% of patients who received discharged instructions and were for primary care (96.7%), sports medicine (1.58%), neurology (0.65%), or other providers (1.11%).

**Conclusions:** There is a lack of consistency in the evaluation and treatment of mTBI in pediatric patients in the LUMC ED. There is a need for guidelines to be set forth in order to ensure adequate patient (or parent) compliance and understanding. More emphasis must be placed on providing educational resources and ensuring appropriate follow-up care for patients, not only to help them manage an existing mTBI, but also to prevent long-term consequences from occurring. Further studies looking at long-term outcomes in these patients would also be beneficial.



**Figure 1.** Frequencies of discharge instruction formats provided to patients. E: standard EMR template for concussion or head injury, W: individualized written instructions, V: individualized verbal instructions provided, O: other supplemental material provided (CDC guidelines or information sheets for management).

## 382 Can Pre-Morbid Echocardiography, Beyond Clinical Risk Factors, Predict Need for Hospitalizing in COVID-19 Patients?

Kothari J, Shah K, Daly T, Taha I, Saraiya P, Le M, Goel H, Shirani J/St. Luke's University Hospital- Bethlehem, Bethlehem, PA



**Study Objective:** Age and medical co-morbidities are well-known risk factors for need for hospitalization in COVID-19. It is unclear whether, and which, baseline echocardiographic abnormalities may refine triage in the emergency department beyond clinical risk factors, and hence help identify patients at higher risk for need for hospitalization. We aimed to investigate echocardiographic variables associated with risk of hospitalization in COVID-19 patients.

**Methods:** Electronic health records (EHR) were screened retrospectively to identify adults with a positive COVID-19 test throughout St. Luke's University Health Network from March 1, 2020–October 31, 2020, and had a transthoracic echocardiogram (TTE) within 15-180 days prior. Baseline medical co-morbidities and echocardiographic variables were compared between patients stratified by hospitalization. Continuous variables were compared using Student's t-test or Mann-Whitney U-test; categorical variables using the  $\chi^2$ -test or Fisher's Exact test. Univariate logistic regression was used to select significant predictors for multivariate analysis. Backward stepwise logistic regression was performed to identify predictors of need for hospitalization, a surrogate for mild versus moderate-severe disease.

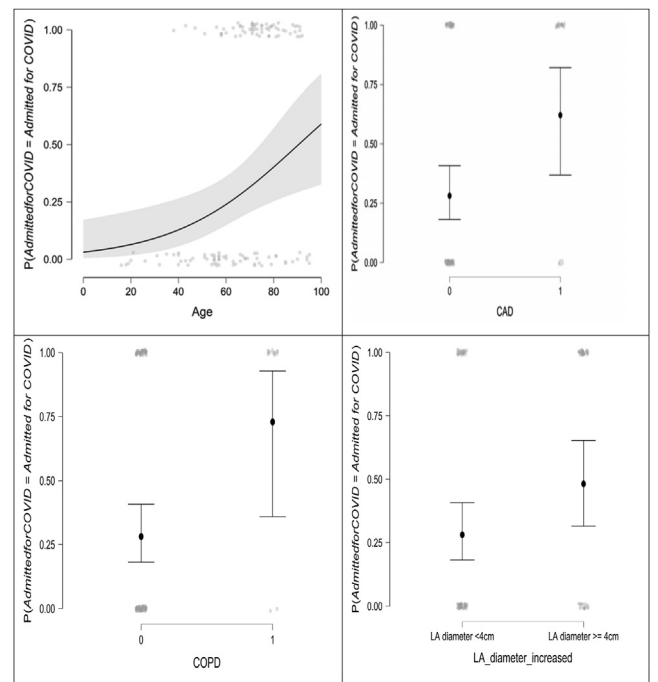
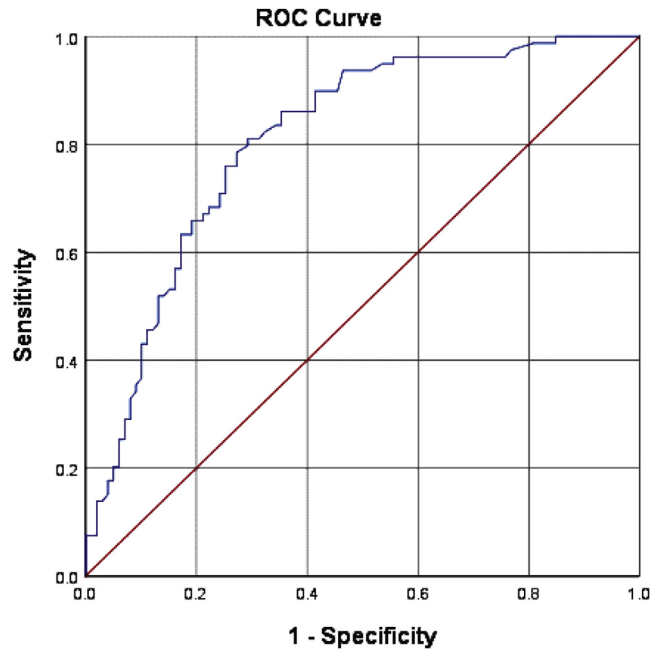
**Results:** 193 patients met inclusion criteria (83 hospitalized). Mean TTE to COVID19 positivity time was  $86 \pm 52$  days. Hospitalized patients were older and more likely to suffer co-morbidities (Table 1). Age, medical co-morbidities and several echocardiographic variables predicted need for hospitalization. Multivariate analysis revealed age, coronary disease, COPD, and left atrial (LA) enlargement ( $\geq 4$  cm) independently predicting hospitalization with excellent discrimination (AUC 0.809, figure 1). Estimates plots are depicted in Figure 2.

**Conclusion:** We present, to our knowledge the first cohort indicating that LA enlargement, in a largely unselected population, is an independent marker of need for hospitalization (a surrogate for worse than mild disease) among COVID-19 patients, and could perhaps be considered in addition to clinical risk assessment in the ED, when available. Being "upstream" from the left ventricle (LV), LA enlargement is an indicator of sustained LV pressure and/or volume overload resulting from diverse etiologies, including hypertension, valvular heart disease, and ischemic heart disease. Hence, LA size has long been known to be an independent predictor of cardiovascular events, stroke, and all-cause mortality among patients with underlying cardiovascular disease as well as the general population. Importantly, LA diameter emerged as a more powerful predictor than LV hypertrophy of COVID-19 severity, as indicated by need for hospitalization.

Variable	Non-hospitalized (n=110)	Hospitalized (n=83)	P
Age (mean±SD)	58±20 years	73±12 years	<0.001
Males	53 (48.2%)	45/83 (54.2%)	0.406
Hypertension	65 (59.1%)	68 (81.9%)	0.001
Diabetes mellitus	29 (26.4%)	42 (50.6%)	0.001
Coronary artery disease	12 (10.9%)	34 (41%)	<0.001
Heart failure	27 (24.5%)	44 (53%)	<0.001
CKD ≥ stage 3	23 (20.9%)	37 (44.6%)	<0.001
COPD	6 (5.5%)	19 (22.9%)	<0.001
LV ejection fraction	0.57±0.09	0.56±0.10	0.270
LV Fractional shortening (%)	31.75±8.53	30.86±8.41	0.489
MV E/A ratio	1.16±0.48	1.07±0.49	0.276
LVEDD (cm)	4.55±0.62	4.60±0.69	0.657
IVSD (cm)	1.04±0.24	1.14±0.26	0.013
LVPWD (cm)	0.99±0.22	1.09±0.23	0.006
LA diameter (cm)	3.66±0.71	4±0.81	0.003
LA diameter ≥ 4 cm	25 (25.3%)	40 (50.6%)	<0.001
LVM (g)	162.1±51.44	189.7±65.41	0.002
LVMi (g/m <sup>2</sup> )	82.81±25.99	96.04±34.83	0.005
Relative Wall Thickness	0.45±0.13	0.49±0.13	0.056
LVH (LVMi >95 g/m <sup>2</sup> in females or >115 g/m <sup>2</sup> in males)	14 (14.3%)	21 (27.3%)	0.033
≥ Moderate PAH	7 (8.9%)	14 (20.3%)	0.049
mean PAP	22.8±6.87	27.29±9.23	0.021
peak PAP	34.11±11.26	41.46±15.12	0.021
TRVmax	2.45±0.48	3.14±3.13	0.063
TRmax PG	24.92±9.96	31.08±15.48	0.006
TAPSE	2.12±0.51	2.08±0.45	0.641

Multivariate regression: age, hypertension, diabetes, coronary disease, chronic renal disease, COPD, left atrial diameter ≥4 cm, left ventricular hypertrophy (LVMi ≥95 g/m<sup>2</sup> in females, and ≥115 g/m<sup>2</sup> in males) RWT (≥0.42) and moderate or higher pulmonary hypertension (PAH)

Variable	B	S.E.	Wald	Odds ratio (95% CI)	p
Age	.038	.014	7.581	1.039 (1.011-1.067)	.006
Coronary artery disease	1.431	.540	7.020	4.184 (1.451-12.063)	.008
COPD	1.930	.814	5.617	6.886 (1.396-33.959)	.018
Left diameter ≥ 4 cm	.867	.427	4.123	2.379 (1.031-5.493)	.042



## 383 Home Oxygen for Discharged Pediatric Bronchiolitis Patients

Johnson M, Thompson J, King R, Demse A, Tuuri R, Swenson K/  
University of New Mexico School of Medicine, Albuquerque, NM

Study Objectives: Bronchiolitis is a leading cause of hospitalization for children younger than 5 years of age and takes on both severe and non-severe forms. Existing studies suggest it may be safe and cost effective for a select group of hypoxemic but otherwise low-risk bronchiolitis patients to be discharged from the pediatric