

Delays in Obtaining Knee MRI in Pediatric Sports Medicine: Private vs Government Based Insurance

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Background

- With continuing efforts to improve health care access, increased enrollment in government based insurance plans has been reported.
- Youth sports injuries are on the rise necessitating increased ordering of advanced imaging such as Magnetic Resonance Imaging (MRI).
- Knee pathology in particular can have long term detrimental effects on young athletes, and early diagnosis and treatment is imperative for optimal recovery.
- While the optimal diagnostic test for knee pathology, MRI is also particularly difficult to efficiently acquire, largely due to pre-authorization requirements from insurance providers.
- Prior studies have shown that in the pediatric sports medicine population, there is no difference in the likelihood of an abnormal knee MRI demonstrating surgically significant findings in patients who did and those who did not undergo a pre-authorization process.
- Thus, the insurance pre-authorization process has not shown to have an impact on preventing unnecessary testing and has poorly predicted eventual patient diagnosis and treatment while unnecessarily causing delays.

Objectives

- This study sought to determine differences in access to knee MRIs between pediatric sports medicine patients with private versus government based insurance plans and reveal at what point in the timeline these delays exist.
- This study also sought to recognize subsequent differences in positive findings leading to eventual operative treatments among these groups.

Methods

- Retrospective review of pediatric patients who attended a sports medicine clinic within a single institution between 2016-17 for routine knee MRI imaging for a sports medicine diagnosis
- Participants were placed into one of two groups based on health insurance status: private or government.
- The timeline of initial presentation to follow up consult was recorded along with the time intervals between MRI order, approval and obtainment.
- Additional demographic data was compiled as well as MRI findings, and any eventual operative treatment. MRI findings were further stratified into normal, minor, and major findings.

| MINOR | MAJOR |
|---|------------------------------|
| Chondromalacia, synovitis | ACL tear |
| Plica | Full thickness meniscus tear |
| Discoid meniscus, partial meniscus tear | OCD |
| Signs of prior patellar dislocation | Loose body/chondral fragment |
| Hoffa pad edema | |

Table 1: Classification of minor vs major MRI findings

Results

Table 2: Median (IQR) in Days stratified by insurance type

| TIMELINE (date→ date) | PRIVATE n = 70 % (n) | GOVT n = 98 % (n) | P vs G p-value |
|--|----------------------------|-------------------------|-------------------|
| Initial evaluation Injury→ 1 st visit | 12 (3.5 - 92) | 5 (1 - 41) | < 0.001 * |
| MRI order 1 st visit→ order | 0 (0 - 1) | 24.5 (3.25 - 59.75) | < 0.001 * |
| MRI approval Order→ approval | 7.5 (2.25 - 13.75) | 6 (4 - 14) | < 0.001 * |
| MRI completion Injury→ completion | 34 (16.75 - 124.25) | 66.5 (38 - 136) | < 0.001 * |
| 1 st visit→ completion | 11 (4 - 24) | 40 (23 - 74) | < 0.001 * |
| Order→ completion | 9 (3 - 14) | 16.5 (9 - 22) | < 0.001 * |
| MRI review Completion→ follow up | 6 (4 - 12.5) | 17 (10 - 27.75) | < 0.001 * |

*Indicates statistical significance at p<0.05

**NOTE: Medians and IQR are calculated after dropping NA. P-values are from wilcox rank sum test.

Table 3: Positive MRI findings and eventual operative treatment (%) stratified by insurance type

| CLINICAL FACTORS | PRIVATE n = 70 % (n) | GOVT n = 98 % (n) | P vs G p-value |
|--|----------------------------|-------------------------|-------------------|
| Positive findings on MRI (%) | 60 (42) | 62 (61) | 0.7700 |
| Major | 39 (27) | 44 (43) | 0.4945 |
| Minor | 20 (14) | 20 (20) | 0.9486 |
| Operative treatment performed (%) | 32 (22) | 42 (41) | 0.2140 |

*Indicates statistical significance at p<0.05

Results

- 178 patients (age 14±3 years) had a knee MRI ordered as part of routine sports medicine care.
 - Of those, 9 were lost to follow up and 1 had no insurance.
 - 168 charts underwent complete review.
- The time between injury and MRI completion was significantly longer with government insurance despite a shorter time to initial presentation.
- The time from MRI order to approval was shorter with government versus private insurance.
- The time between presentation and MRI completion as well as the time between MRI order and completion was significantly longer with government versus private insurance.
- There was no significant difference in positive findings on MRI between patients with private and government insurance, including both major and minor findings.
- Similarly, there was no significant difference in patients receiving eventual operative treatment among both groups.

Conclusions

Pediatric sports medicine patients with government insurance have delays in ordering, completion, and follow up of knee MRIs in comparison to private insurance plans, despite the fact that there is no difference in the rate of positive findings and subsequent operative treatments.

Interestingly, the time from MRI order to approval was significantly shorter with government versus private insurance, indicating that the delays of care experienced by public insurance patients occur outside of the pre-authorization process and occur more so in the process of scheduling and attending clinical appointments and exams.

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