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Overturn of Advanced Imaging Prior Authorization Denials at Independent Review in Medicare Advantage

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Introduction/Background
Medicare Advantage covers most Medicare beneficiaries, and prior authorization for advanced imaging is nearly universal and increasingly adjudicated with algorithmic utilization-management tools. Federal reporting is aggregated at the contract level, so imaging-specific denial patterns are difficult to measure. Independent review entity decisions are one publicly available service-level window. Prior work applied this window to radiation therapy and head and neck surgery, but not to advanced imaging, and did not separate prior authorization from other appeal types.

Methods/Intervention
We conducted a cross-sectional analysis of the Centers for Medicare and Medicaid Services Appeals Decision Search, covering Part C independent review decisions from January 2020 through May 2025. We restricted the cohort to advanced imaging (computed tomography, magnetic resonance imaging, positron emission tomography, and computed tomographic angiography) and, using a rule anchored to the templated decision rationale, isolated pre-service prior authorization denials from claims and cost-sharing appeals. A favorable decision indicated an overturned denial. A blinded co-author who did not develop the rule validated the classification on 240 records. We compared overturn rates using the chi-square test.

Results/Outcome
Among 19,739 advanced imaging appeals, 9,160 were prior authorization denials. These were overturned in 1,878 of 9,160 (20.5%), compared with 15,569 of 378,538 (4.1%) for all-services prior authorization (risk ratio, 4.98 [95% CI, 4.77-5.20]; P < .001). Overturn rates ranged from 16.6% to 23.0% across modalities. Blinded validation showed 97.9% classification accuracy and 100% positive predictive value for the prior authorization category.

Conclusion
In the one federal window permitting service-level analysis, advanced imaging prior authorization denials in Medicare Advantage were overturned at independent review about five times as often as prior authorization denials overall. Because appealed cases are highly selected, this reveals a marked service-level disparity rather than establishing that the original denials were inappropriate.

Statement of Impact
As algorithmic tools increasingly drive imaging prior authorization, the absence of service-level federal reporting conceals these patterns. These findings quantify that gap using the one available window, support mandatory service-level reporting of Medicare Advantage prior authorization outcomes, and argue for

independent evaluation of the algorithms used to adjudicate advanced imaging.

Keywords
Prior authorization; Medicare Advantage; Utilization management; Artificial intelligence; Advanced imaging; Health policy