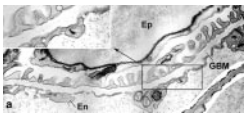
This Month's Highlights

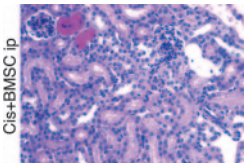
BASIC RESEARCH

Dysregulation of Laminins Plays a Role in Alport Disease



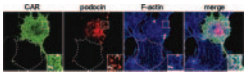
In Alport disease, the glomerular basement membranes contain aberrant laminins in addition to the abnormal collagenous network that results from mutations in the genes encoding the α3, α4, or α5 chains of type IV collagen. In a mouse model of Alport disease, Abrahamson and colleagues report a significant increase in glomerular laminin α5 that is the result of increased *Lama5* gene transcription. They found that Alport glomerular basement membranes are abnormally permeable both in thickened areas beneath effaced podocyte foot processes as well as in otherwise normal-appearing areas. The altered synthesis and distribution of laminins, which may occur as a compensatory response to the disordered collagenous network, likely contribute to this dysfunction of Alport glomerular basement membranes. *See Abrahamson et al., pages 2465–2472.*

Bone Marrow-Derived Stromal Cells Secrete Renoprotective Factors



Recent evidence suggests that adult bone marrow cells may be able to protect organs from injury. Bi and colleagues found that administering bone marrow stromal cells to mice reduces the severity of cisplatin-induced nephrotoxicity, enhances tubular cell proliferation, and reduces tubular cell apoptosis. Furthermore, they observed that intraperitoneal injection of conditioned medium from cultured stromal cells also improves survival and reduces renal injury in this model. This suggests that marrow stromal cells secrete protective factors that function in an endocrine manner, providing hope for novel therapies to treat acute kidney injury. *See Bi et al., pages 2486–2496.*

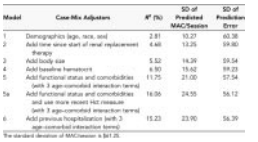
Podocin Tethers Tight Junction Proteins to the Cytoskeleton in Nephrotic Podocytes



In nephrotic syndrome, slit diaphragms are lost and tight junctions are created between effaced podocyte foot processes. Shono and colleagues report that podocin, a structural protein of the slit diaphragm, is recruited to newly formed tight junctions where it forms a multiprotein complex with coxsackievirus and adenovirus receptor (CAR) and zonula occludens 1 (ZO-1). Podocin facilitates the coalescence of lipid rafts containing CAR and tethers this protein complex to a reorganized actin cytoskeleton. Therefore, podocin not only serves as a structural protein in the slit diaphragms of normal podocytes, but it also seems to secure the tight junctions to the cytoskeleton in nephrotic foot processes. See Shono et al., pages 2525–2533.

CLINICAL EPIDEMIOLOGY

Weighing the Costs of Prospective Payments



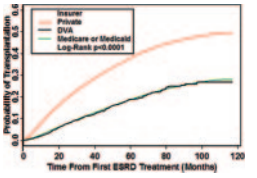
Model	Case-Mix Adjusters	R^2 (%)	SD of Predicted MAC/Session	SD of Prediction Error
1	Demographics (age, race, sex)	2.81	10.27	60.38
2	Add time since start of renal replacement therapy	4.48	13.25	59.80
3	Add body size	5.52	14.29	59.54
4	Add baseline hematocrit	6.90	15.62	59.23
5	Add functional status and comorbidities (with 3 age-corrected interaction terms)	11.75	21.00	57.54
5a	Add functional status and comorbidities and use more recent Hct measure (with 3 age-corrected interaction terms)	16.06	24.55	56.12
6	Add previous hospitalization (with 3 age-corrected interaction terms)	15.23	23.90	56.39

The standard deviation of MAC/session is $41.25.

Medicare is considering an expansion of the bundle of dialysis-related services that are prospectively paid for. Hirth and colleagues developed models to explore whether case-mix adjustment could incorporate interindividual variation in required services into this potential payment scheme. Even after considering a broad set of patient characteristics, much of the variation in Medicare Allowable Charges per dialysis session remains unexplained. The authors note that significant gains or losses to individual providers would occur, even though the systematic gains or losses would be modest when compared across different classes of dialysis providers. *See Hirth et al., pages 2565–2574.*

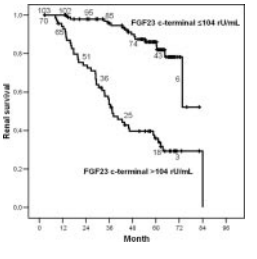
CLINICAL RESEARCH

Veterans Transplanted Less Than the Privately Insured



Patients who wish to receive a kidney transplant through the Department of Veteran Affairs must complete a centralized assessment to determine eligibility and must receive their transplant at one of four VA transplant centers nationwide. Gill and colleagues found that veterans without supplemental private insurance are approximately 35% less likely to receive transplants than individuals with private insurance. Although most of this difference can be attributed to the fact that veterans have a lower chance of being placed on the wait-list, this does not fully explain the disparity. *See Gill et al., pages 2592–2599.*

FGF23 Predicts Progression



Calcium-phosphate metabolism is abnormal in patients with chronic kidney disease, and it is unknown whether this accelerates the decline of renal function. Fibroblast growth factor 23 (FGF23) is a recently identified phosphaturic hormone that plays a role in phosphate homeostasis. Fliser and colleagues prospectively followed 177 nondiabetic patients with chronic kidney disease and found that serum levels of FGF23 predict progression of renal disease. In fact, apart from glomerular filtration rate at baseline, FGF23 was the only independent predictor of progression among several measures of calcium-phosphate metabolism. In the future, FGF23 levels may help guide therapy aimed at correcting derangements in calcium-phosphate metabolism, and such therapy may modify the progression of chronic kidney disease. *See Fliser et al., pages 2600–2608.*