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Poster Presentation

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Paradigm Shift – the impact of early rapid genomic sequencing in the diagnosis of kidney disease

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Background: Rapid genomic sequencing with results available in clinically meaningful timeframes is becoming feasible. Its role in the diagnosis and management of patients with kidney disease is unclear.

Methods: Patients were recruited prospectively for rapid whole exome sequencing (WES) with analysis of a pre-determined phenotype specific list of genes of interest and results available in less than 2 weeks. This followed review by a nephrologist, clinical geneticist and genetic counsellor who considered inclusion if a result was likely to significantly impact clinical management, particularly avoiding kidney biopsies in younger children. Full author list online at KidGen.org.au

Results: Ten patients (7 pediatric, 5 female) were recruited ranging in age from 1 month to 55 years. Indications for rapid testing were to avoid a renal biopsy (8) and to facilitate transplant planning (2). Five patients received a definitive diagnosis (ADPKD, Dent disease, primary hyperoxaluria, Alport syndrome and ciliopathy), 1 received a diagnosis which was likely unrelated to their kidney disease (MIRAGE syndrome). One patient's negative result facilitated sibling donor workup. The most significant result in this cohort was an unexpected diagnosis of primary hyperoxaluria in a 6-month old presenting in renal failure. WES results were available within 5 days informing conversion from peritoneal dialysis to hemodialysis and planning for a sequential liver-kidney transplant. This avoided the significant morbidity of oxalate deposition in extra-renal tissues leading to fractures, visual

impairment and heart failure and recurrence of the disease if an isolated renal transplant had been performed.

Conclusion: Rapid genomic sequencing has high diagnostic utility in selected patients with renal disease and can inform clinical management within meaningful timeframes. It has the potential to transform the diagnostic pathway for young children, particularly where invasive renal biopsies can be avoided.