This year, as well as providing a summary of current trends in the frequency and causes of ESKD, the paediatric report will focus on dialysis delivery and adequacy, technique survival and biochemical outcomes, as well as an overview of the frequency, causes and treatment of children and adolescents with ESKD.

**Incidence and Prevalence of ESKD in Children and Adolescents 1991 - 2012**

**General Overview**

As shown in Figure 11.1, there is no clear long term trend in the incidence of children and adolescents developing ESKD and being treated with renal replacement therapy, although there are fluctuations from year to year. Prevalent numbers of treated ESKD have gradually increased across all age groups reflecting improved survival through increased duration of ESKD (Figure 11.2).

**Figure 11.1**

Incidence of RRT - Age 0-17 Years

- **Australia**
- **New Zealand**

**Figure 11.2**

Prevalence of RRT - Age 0-17 Years

- **Australia**
- **New Zealand**
CAUSES OF ESKD IN CHILDREN AND ADOLESCENTS 2007 - 2012

Overall, glomerulonephritis remains the most common cause of ESKD in children and adolescents (29%) but causes vary significantly with age. In young children renal hypoplasia/dysplasia is the most common cause while reflux nephropathy is a common cause of ESKD in adolescents.

Figure 11.3

Causes of End Stage Kidney Disease In Children and Adolescents 2007 - 2012
Australia and New Zealand

<table>
<thead>
<tr>
<th>Primary Renal Disease</th>
<th>Age Groups (Years)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-4</td>
<td>5-9</td>
</tr>
<tr>
<td>GN</td>
<td>10 (12%)</td>
<td>20 (31%)</td>
</tr>
<tr>
<td>Familial GN</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Reflux Nephropathy</td>
<td>4 (5%)</td>
<td>2 (3%)</td>
</tr>
<tr>
<td>Polycystic Kidney Disease</td>
<td>8 (10%)</td>
<td>5 (8%)</td>
</tr>
<tr>
<td>Medullary Cystic Disease</td>
<td>-</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>Posterior Urethral Valve</td>
<td>7 (9%)</td>
<td>-</td>
</tr>
<tr>
<td>Haemolytic Uraemic Syndrome</td>
<td>7 (9%)</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>Hypoplasia/Dysplasia</td>
<td>24 (29%)</td>
<td>14 (22%)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cortical Necrosis</td>
<td>2 (2%)</td>
<td>2 (3%)</td>
</tr>
<tr>
<td>Interstitial Nephritis</td>
<td>-</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>Cystinosis</td>
<td>-</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>Uncertain</td>
<td>1 (1%)</td>
<td>2 (3%)</td>
</tr>
<tr>
<td>Misc/Other</td>
<td>19 (23%)</td>
<td>16 (25%)</td>
</tr>
</tbody>
</table>

Total 82 65 83 100 330
MODALITY OF TREATMENT  2007 - 2012

The modality of the first renal replacement treatment is shown in Figure 11.4. Although numbers are small and therefore fluctuate from year to year, around 20% of children and adolescents receive pre-emptive kidney transplants. Of the remainder, similar numbers commence renal replacement therapy with haemodialysis or peritoneal dialysis.

For prevalent patients (Figure 11.5), a very different pattern is seen, with the great majority of children and adolescents treated with a functioning transplant. This reflects the relatively high rate of transplantation among children.
Figure 11.6 and 11.7 summarise the recent trends in HD practice among Paediatric patients.

**Figure 11.6**

Mean Sessions per Week (95% CI)
Among Haemodialysis Patients
December 2008-2012

**Figure 11.7**

Mean Hours per Session (95% CI)
Among Haemodialysis Patients
December 2008-2012
HAEMOGLOBIN

Various dialysis process indicators are summarized in Figures 11.8 - 11.16. For all of these graphs, the box indicates the 25th, 50th, and 75th centiles. The “Whiskers” indicate the 95th centiles for each category.

Figure 11.8

Haemoglobin, December 2008-2012

Australia

Haemodialysis

Peritoneal Dialysis

New Zealand

Haemodialysis

Peritoneal Dialysis

ERYTHROPOIETIC AGENT USAGE

Figure 11.9

Use of Erythropoietic Agents
December 2008-2012

Australia

New Zealand

FERRITIN

Figure 11.10

Ferritin, December 2008-2012

Australia

New Zealand
Dialysis adequacy is reported for the majority of NZ patients. However the reporting rates of adequacy for Australian patients are low, particularly for those on PD. The NZ data suggest that the majority of patients meet accepted targets for adequacy.

**Proportion of Prevalent Patients for whom URR or Kt/V was reported < 18 Years of Age at 31st December in Australia and New Zealand 2008 - 2012**

<table>
<thead>
<tr>
<th>Current Treatment</th>
<th>Modality</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2008</td>
</tr>
<tr>
<td>Australia</td>
<td>Haemodialysis</td>
<td>56%</td>
</tr>
<tr>
<td>Australia</td>
<td>Peritoneal Dialysis</td>
<td>13%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Haemodialysis</td>
<td>80%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Peritoneal Dialysis</td>
<td>94%</td>
</tr>
</tbody>
</table>
**BIOCHEMICAL OUTCOMES**

**SERUM CALCIUM**

*Figure 11.15*

**Serum Calcium, December 2008-2012**

- **Australia**
  - Haemodialysis
  - Peritoneal Dialysis

**Serum Calcium, December 2008-2012**

- **New Zealand**
  - Haemodialysis
  - Peritoneal Dialysis

**SERUM PHOSPHATE**

For HD patients, Serum Phosphate is reported from a pre-dialysis specimen of a mid–week session.

*Figure 11.16*

**Serum Phosphate, December 2008-2012**

- **Australia**
  - Haemodialysis
  - Peritoneal Dialysis

**Serum Phosphate, December 2008-2012**

- **New Zealand**
  - Haemodialysis
  - Peritoneal Dialysis
Vascular access for haemodialysis is summarised in Figures 11.17 -11.18.

AT FIRST TREATMENT HAEMODIALYSIS ACCESS

Figure 11.17

Vascular Access at First Treatment
Australia 2008-2012

Vascular Access at First Treatment
New Zealand 2008-2012

PREVALENT HAEMODIALYSIS ACCESS

Figure 11.18

Prevalent Haemodialysis Access
Australia 2008-2012

Prevalent Haemodialysis Access
New Zealand 2008-2012
Haemodialysis technique survival, censored for transplantation, loss to follow-up and recovery of renal function is presented above.

Of the total 137 patients, 54 changed from HD to PD. Of those 54 patients, 30% changed within 30 days, 35% changed between 1 to 2 months and 31% changed between 2 and 6 months. 31% of patients received a transplant within 1 year and 34% received a transplant within 2 years.
PD technique survival, censored for transplantation, loss to follow-up and recovery of renal function is presented below. The numbers available for analysis after the first year drop significantly in each age group in both countries, due to transplantation. Of the 170 patients, 41 (24%) received a transplant within one year of commencement of RRT. By two years a total of 73 (43%) of patients had received transplants.

Use of PD solutions is shown in Figure 11.23.

**Figure 11.21**

PD Technique Survival by Age Category

**Figure 11.22**

PD Technique Survival by Age Category

**Figure 11.23**

Use of PD Solutions 2009 - 2012

<table>
<thead>
<tr>
<th>Solutions</th>
<th>Australia</th>
<th>New Zealand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose</td>
<td>(n = 43)</td>
<td>(n = 40)</td>
</tr>
<tr>
<td></td>
<td>42 (98%)</td>
<td>30 (75%)</td>
</tr>
<tr>
<td>Icodextrin</td>
<td>2 (5%)</td>
<td>2 (5%)</td>
</tr>
<tr>
<td>Low GDP Lactate</td>
<td>11 (26%)</td>
<td>17 (43%)</td>
</tr>
<tr>
<td>Low GDP Bicarbonate</td>
<td>1 (2%)</td>
<td>8 (20%)</td>
</tr>
</tbody>
</table>
**TIME TO FIRST PERITONITIS FOR PATIENTS < 18 YEARS OLD**

Figure 11.24

First PD Treatment to First Peritonitis by Age at First PD
Australia and New Zealand
2008-2012

Prior to 2012, there has not been an appreciable change in peritonitis rates in Australia, which have been around 1 episode of peritonitis per patient year. Time from commencement of PD to first peritonitis tends to be shorter in younger patients.

**PERITONITIS RATES FOR PATIENTS < 18 YEARS OLD**

Figure 11.25

Episodes of Peritonitis per Patient-Year and Patient-Months per Episode
Australia
2004 - 2012