PART V
DEMONSTRATIONS
In vivo and in vitro Assessment of the Rhône Poulenc Disposable Dialyser (Type 1 B)
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The performance of the Rhône Poulenc disposable 8 layer Kiil type dialyser was compared with the performance of the standard Watson Marlow Kiil. Both dialysers were tested on the same patients over a range of pumped blood flows from 75-300 ml/min, with a single pass dialysate flow of 500 ml/min delivered by a Lucas single patient proportionating and monitoring unit. Dialysance measurements were made in the third and fourth hours of dialysis when stable conditions prevail.

Dialysance characteristics of increasing dialysate flow were assessed under standard in vitro conditions (Figure 1).

Dialysance curves obtained on reuse following wash through with 2 litres of normal saline before formalin sterilisation as for the Kiil and 2 litres of saline prior to reuse were compared with comparable curves obtained at the first use (Figure 2).

![Figure 1. Rhône Poulenc dialyser. Variation of urea and creatinine dialysance with increasing dialysate flow (in vitro)](image-url)
Figure 2. Rhône Poulenc dialyser reuse
RESULTS

The Rhône Poulenc Kidney is an easily handled compact disposable dialyser with a priming volume of 160 ml and a total circuit volume of 264 ml compared with values of 105 and 384 ml respectively for the Kiil.

Pumped blood flow

Dialysance studies show that the RP kidney (0.84 m²) to be slightly inferior to the Watson Marlow Kiil (1.02 m²) at pumped blood flows greater than 150 ml/min.

<table>
<thead>
<tr>
<th>Blood Flow</th>
<th>Kil</th>
<th>RP</th>
<th>Kil</th>
<th>RP</th>
<th>WM 12 dialysance curves, 105 points</th>
<th>RP 14 dialysance curves, 115 points</th>
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<tbody>
<tr>
<td>100</td>
<td>67+1.5</td>
<td>63+1.4</td>
<td>83+1.2</td>
<td>74+1.3</td>
<td>96+2.0</td>
<td>82+2.0</td>
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<td>150</td>
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<td>250 ml/min</td>
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Mean ± 95% confidence limits

The position of the RP dialyser does not significantly influence dialysance performance, there being no significant difference between the 45° (14 dialysance curves, 115 points) and 90° to horizontal position arterial end up (10 dialysance curves, 65 points).

![Graph](image-url)

*Figure 3. Rhône Poulenc dialyser. Comparison of urea and creatinine dialysance at dialysate flow 500 ml/min and 800 ml/min*
Unpumped blood flows

The low internal resistance of the RP dialyser allows higher blood flows in an unpumped circuit than can be obtained in the unpumped Kiil. Under these conditions urea and creatinine dialysance are superior in the RP dialyser (comparison on four patients).

Dialysate flow

Increasing dialysate flow from 500-800 ml/min can be expected to increase urea and creatinine dialysance marginally, 5-8% and 7-8% respectively (Figures 1 and 3).

Residual blood volume

Residual blood volumes are low with an average of 5-6 ml (14 observations) and most falling in the range of the Kiil (1-4 ml).

Ultrafiltration rate

The ultrafiltration rate is 5 ml/min or 300 ml/hour at a net transmembrane pressure of 200 mm Hg.

Reuse

Reuse is not recommended since dialysance studies show a 22% and 16% decrease in urea and creatinine dialysance respectively with subsequent reuse, in four out of six cases. Little increase in urea and creatinine dialysance above 55 and 47 ml/min respectively can be expected for blood flows greater than 140 ml/min (Figure 2).