

# Continuous Renal Replacement? Give us a Break!

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*Modern intermittent renal replacement therapy is underused in UK intensive care units whereas continuous techniques are often used as a “one size fits all” approach. This needs to change.*

## The Status Quo

Each year around 10,000 patients receive renal replacement therapy (RRT) in UK intensive care units (ICUs). In over 90% of units the preferred technique is continuous renal replacement therapy (CRRT). Only 10% of ICUs offer intermittent renal replacement therapy (IRRT)<sup>1</sup>.

The indications for RRT are as varied as the patients who require it. Current practice in the UK does not reflect the opinion that IRRT may be the best choice for a growing number of ICU patients.

## A Ball and Chain

Most CRRT is a variant of continuous veno-venous haemofiltration. It is suggested that continuous techniques offer greater haemodynamic stability in critical illness but they are inflexible and their 24-hour nature is a physical restraint. This limits the other care patients can receive. Bleeding complications (due to anticoagulation) and hypothermia may also be more common. When breaks in filtration occur, they do so at the expense of the total dose of RRT delivered.

## Give us a Break!

IRRT is usually delivered in the form of intermittent haemodialysis (IHD). Nowadays IHD represents a flexible choice for critical care. Terms such as “pulsed high volume haemodiafiltration” and “slow low efficiency daily dialysis” (SLEDD) highlight how the intensity, duration of and interval between dialysis can be adapted to changing demands during each patient’s illness. The periods between IHD also provide practical benefits for patients, staff and the process of care.

## The Evidence

Multiple studies have found IRRT to be equivalent to CRRT in terms of renal recovery and patient survival<sup>2</sup>. Unfortunately patient selection, crossover between therapies and variation in the protocols used have frequently confounded such trials<sup>3</sup>.



### Intermittent Renal Replacement Therapy - Advantages

#### Patient:

- Improved sleep
- Better mobility/physiotherapy

#### Medical:

- Reduction in anticoagulation
- Easier identification of pyrexia
- Faster removal of small solutes

#### Process of Care:

- Opportunity for investigations
- Less demands on nursing time
- Improved ICU bed utilisation
- Reduced costs



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## The Bottom Line

There are already patients in whom IRRT may be preferred, for example post operative patients (bleeding concerns) and those with life-threatening hyperkalaemia. Time “off filter” is also desirable for long-stay patients with weaning and physiotherapy needs. Anecdotally, ICUs that use modern IHD also report that haemodynamic instability is less of a concern than was previously thought.

Taken together with the evidence, there seems to be a growing cohort of ICU patients in whom IRRT is at least as good as CRRT. In these circumstances, financial concerns are also important. Estimates vary but IRRT is around £180 per day cheaper than CRRT<sup>4</sup>.

## Myths about Dialysis

### “You need a huge water treatment plant”

Although convenient this is not essential. Compact/portable water purification systems are available for home/ICU settings.

### “You need renal nurses and a nephrologist”

The introduction of IRRT necessitates staff training but once established the prescription and delivery of dialysis becomes routine. In a recent study ICU nurses found SLEDD to be easy to use and preferable to CRRT due to the reduced monitoring demands<sup>5</sup>.

## The Future...

Intermittent renal replacement therapy is a cost effective and flexible way to treat acute renal failure in the ICU. For some patients it may be the gold standard. We should use it alongside continuous techniques to offer tailored therapy for every patient every time.

## References

1. Gatward J et al. Renal replacement therapy for acute renal failure: a survey of practice in adult intensive care units in the United Kingdom. *Anaesthesia*, 2008, 63;959.
2. Vanholder R et al. Pro/con debate: continuous versus intermittent dialysis for acute kidney injury: a never-ending story yet approaching the finish? *Critical Care*, 2011, 15;204.
3. Ronco C et al. Dialysis in intensive care unit patients with acute kidney injury: continuous therapy is superior. *Clinical Journal of the American Society of Nephrology*, 2007, 2;597.
4. Srisawat N et al. Cost of acute renal replacement therapy in the ICU: results from the beginning and ending supportive therapy for the kidney (BEST kidney) study. *Critical Care*, 2010, 14;R46.
5. Patel R et al. Local experience with the use of sustained low efficiency dialysis for acute renal failure. *Intensive and Critical Care Nursing*, 2009, 25;45.