

IV fluid therapy in post-operative oliguria

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This is a common problem seen on overtime.

First step is to ensure that it is true oliguria. That is, make sure that the indwelling urinary catheter isn't blocked or that there isn't a post-operative urinary obstruction/retention (by physical examination of the abdomen and a ward bladder scan optimally).

"Low urine output" in a non-catheterised patient in the middle of the night is usually a furphy. My "urine output" is usually zero as well. Any patient with suspected oliguria needs an indwelling catheter and hourly urine output measurements.

Secondly, ensure that the patient doesn't have pre-existing renal failure to explain the oliguria (look up the pre-op UECs).

Any urine output below 30 mL/h should be considered acute renal failure, but that doesn't mean that a urine output of 40 mL/h is "okay". Optimally, you should aim for a urine output of at least 1 mL/kg/hr.

Your target post-operative urine output is > 1 mL/kg/hr

Assuming the patient has previously normal renal function, oliguria indicates significant dehydration/fluid deficit.

A good "formulative" approach to this is:

Algorithm for post-operative oliguria

Fluid choice: **0.9% NaCl** (normal saline), 1 L bags.

- **Step 1:** 500 mL bolus, then the remainder of the bag at 500 mL/h (q2h), *then*
- **Step 2:** A bag at 250 mL/h (q4h), *then*
- **Step 3:** A bag at 166 mL/h (q6h), *then*
- Proceed onto usual [maintenance fluids](#).

DO

- Review fluid hydration at the completion of each "bag" of fluid;
- if inadequate response, either repeat the current "step", or go back a step;
- be mindful of spurious causes of oliguria;
- be mindful of possible acute tubular necrosis if poor responses to fluid challenges;
- be mindful of possible occult fluid losses (e.g., third space losses and hidden post-operative bleeding);
- check electrolytes, urea and creatinine the next morning.

If on review, the patient has signs of shock, then proceed immediately to [fluid resuscitation](#).

- Otherwise, first give a bolus (i.e., as quickly as it will go) of 500 mL of 0.9% NaCl (normal saline) and then increase the rate of fluids after the bolus to 500 mL/hr (i.e., q2h).
- Review in an hour (which should be when the 1 litre bag of saline finishes). There should, hopefully be an increase in the urine output in the past hour.
- If not, give another bolus and continue the rate of fluids at 500 mL/hr.

If there is still no improvement in the urine output after that (i.e., you have given 2 litres of fluids over two hours), this usually means that the patient has gone into acute renal failure (i.e., **acute tubular necrosis**) and you cannot use the urine output to necessarily judge the adequacy of your intravenous fluid therapy (need to assess the patient's fluid status more generally and look at the JVP to ensure you aren't overloading the patient).

If there is a good response to the first or second bolus of fluid, then the next bag of fluid should be 0.9% NaCl at 250 mL/h (i.e., q4h).

- The bag after that should be Normal Saline at 166 mL/h (or q6h).
- The bag after that should be Normal Saline at 125 mL/h (or q8h) which should be back to approximately [maintenance](#).

Updated: Michael Tam (19 June 2006)

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