



# Critical results: when things go wrong

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# What happened

- Female aged 75y
- Transferred from another hospital for management of acute kidney injury secondary to sepsis (pneumonia)
- PMH:
  - Ischaemic stroke following endocarditis
  - Metallic heart valves
  - on Warfarin 2mg 5 days/wk and 3mg Wed, Sun
  - Target INR 2.5-3.5

# Management

- Creatinine 403 (eGFR 9)
- Albumin 11 (NR 38-48)
- No Liver function tests recorded
  
- Patient started on IV antibiotics
- Warfarin prescribed as per Trust anticoagulation chart

# Anticoagulant management

Day & Time	Warfarin dose given	INR result	INR result time	INR result documented on chart ?
Friday	2mg			
Saturday 6pm	2mg	2.7	5.30 pm	No
Sunday 6pm	3mg	3	08.30 am	Yes
Monday 6pm	3mg	5.5	09.16 am	No
Tuesday	Omitted – based on prev day result	>10	08.45am	No
wednesday		>10		

Results in red were not considered when prescribing warfarin

- **Tuesday:** Patient seen on am ward round. Warfarin omitted on basis of INR 5.5 prev day
- Medical team not informed or aware of result of >10 which was available on the electronic report system after patient had been seen.
  - Lab report: “unable to contact ward, phone unanswered for 2 mins”
- **Wednesday am:** patient had deteriorating LOC. Diagnosis of haemorrhagic stroke. Given PCC but died.

# High level incident investigation

- **1:** Warfarin 3mg was prescribed on 2 consecutive days which was not the normal dosage routine. (Normal dose - 2 mg daily and 3 mg on Wednesdays and Sundays).
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- **2:** INR levels were requested daily and blood samples sent to the lab at an appropriate time but the results were not checked daily. The INR level of 5.5 reported at 09.16 on 31/03/2014 should have prompted the omission of the warfarin dose on the day.
- **3:** INR results had not been entered on the anticoagulant record sheet daily.



- **4:** The Standard Operating Procedure in the laboratory for abnormal INR was not followed.
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- **5:** Advice was not sought from the Haematology clinical team when the INR was greater than 5.0 on 31/03/2014 as per trust guidelines.

# Overall findings

- **SDP1:** Processes for checking INR results daily on the ward are not robust.
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- **SDP2:** A safety measure is in place within the Haematology Laboratory which has a Standard Operating Procedure to inform the clinical team on the ward of clinically significant abnormal result. The procedure relies upon a number of tasks being undertaken in succession, which are susceptible to human error.
- **Incidental finding:** Liver Function Tests were not undertaken but would have been useful to help patient management as this might indicate sensitivity to Warfarin.



# Root Causes

- **RC1:** Processes on the ward to ensure that the results from INR tests are reviewed and actioned are not robust.
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- **RC2:** Existing safety measures in the Haematology laboratory of alerting clinical teams of critically abnormal results are subject to human error.

# For discussion

- Who is responsible for responding to critical results?
  - Doctors for not checking results?
    - (but nurses request tests on behalf of Drs, medical shift patterns and low staffing with inexperienced drs out of hours)
  - Lab for not making clinical teams aware?
  - Doctors for not following procedure and checking INR before prescription?
  - Lack of awareness of significance of rising INR results?

# Recommendations

- Explore an IT solution for better direct communication of clinically significant results to clinical teams.
- That the management of patients on anti-coagulation are included in the junior doctor's teaching sessions.
- Review existing Trust Guidelines and Policies on anticoagulation. While there is excellent guidance on the 'General Management of bleeding or excessive anticoagulation in adult patients on warfarin (or sinthrome) there is a lack of expert guidance on day-to-day management of anticoagulation in complex in-patients especially with reference to frequency of INR monitoring. Clinical lead for anticoagulation to consider an addendum to Warfarin prescription guidelines to cover this aspect.