



Using DAWN AC for Paediatric Patients Managed on Warfarin

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Overview



- Introduction
- Background
- Dosing considerations for paediatric patients
- Benefits of using DAWN AC
- Limitations of using DAWN AC
- The future

Introduction

- Why do we need a dedicated paediatric warfarin clinic?
 - Practical considerations
 - High number of paediatric patients on warfarin
 - No formal anticoagulation service for any paediatric specialty
 - Clinical considerations
 - Different pharmacokinetics
 - Variations in weight-dose and age-dose responses
 - Frequent intercurrent illnesses
 - Variable dietary intake
 - Often on concurrent medication

Background



- NPSA Patient Safety Alert 18: Actions that can make anticoagulants safer

Old Service	New Service
Based on acute paediatric ward	Formal, dedicated outpatient clinic based in a clinic room
Parents phoned on an ad hoc basis; no follow up if they failed to ring	Formal appointment times and follow up if appointment missed
Paper records kept. No written communication with GP/parents. No formal follow up arrangements.	Computerised recording system (DAWN AC!) which does it all!

Indications for Warfarin in Paediatric Patients



- Cardiology
 - Fontan-type circulation
 - MVR/AVR
 - Kawasaki's disease
- Neurology
 - Venous sinus thrombosis
- Hepatology
 - Shunts
- Haematology
 - Thrombosis

Dosing Considerations in Paediatric Patients



- Seemingly insignificant changes can affect the INR
- Seem to be more sensitive to changes in dose
- Require more frequent monitoring
 - Growth spurt
 - Vaccines
 - Term time vs. school holidays
 - Puberty
 - Menstruation
 - Feeding regimes

Risk class: Paediatrics Home
 Pref. clinic: Paediatrics Friday (HOSP)
 Phone: 0113 2946308 - home
 Trt. plan: AC: 09/05/2012 active

In range: 83% (Since 02/10/2012)
 Diagnosis: Mitral Valve Rep Mechanical
 Risks:
 Age: 15
 Target range: **Target 3.00 (2.5 - 3.5)**
 Anticoagulant: Warfarin half Mg Tablets
 Start date: 09/05/2012
 Duration: Indefinite

Dosing | Contacts | Letters | Drugs | Events | Procedures | Reviews | Reminders | Groups | Documents | Owners | Account | Audit

INR: Date: 01/10/2013

Scheduled for Tue 01/10/2013, 10:30 - 10:40
 in clinic: Paediatrics Tuesday Reschedule manually

No warnings

Treatment notes

(dose zero) Dose: 0.00
 Status: **Scheduled** Next:
 Accept INR DNA Un-schedule

worried might miss appointment, so if she doesn't ring, please try and call back

27/8/13 - ?feeds cause INR to drop. When feeds are stopped, INR can increase

Paediatrics - Brown Jennifer 17/09/2013 10:58
 To stay on 5nights on feeds, 2 nights off for next couple of weeks until dietician review. Therefore kept dose the same and recheck in 2/52

Paediatrics - Brown Jennifer 10/09/2013 10:34
 Dietician said to stay off feeds for 2 nights over the weekend, but mum left it off for 3 nights. INR increased but and no signs of bleeding. Likely it will come down with feeds, so left dose the same. Mum was asking if he should stay on his feeds to keep warfarin stable but I said we can check his INR more frequently to ensure it's not fluctuating too much with changes in his feed pattern and I didn't want warfarin to dictate whether he can have his feeds off or not. Recheck in 1/52, but Mum will recheck sooner if concerned and get in touch. ?could look at doing a week day dose and lower weekend dose if he is to stay off his feeds over the weekend long term. Mum will let us know

Graph History Personal Treatment plans Ad Hoc Questionnaires

Date	INR	Dose	Dosing instructions	Time	DNA	In range	Comments
Tue 01/10/2013	0.0	0.00 d					
Tue 17/09/2013	2.8	4.00 d	4mg Daily	2 wk		4mg/4mg/4.5mg	
Tue 10/09/2013	3.9	4.00 d	4mg Daily	7 d		4mg/4mg/4.5mg	
Tue 27/08/2013	3.0	4.00 d	4mg Daily	2 wk		4mg/4mg/4.5mg	
Tue 20/08/2013	2.7	4.00 d	4mg Daily	7 d		4mg/4mg/4.5mg	
Tue 06/08/2013	3.9	4.00 d	4mg Daily	2 wk			
Fri 02/08/2013	4.0	4.21 d	4mg/4mg Alternate Days	2 wk		4mg, 4mg, 4.5mg	
Fri 19/07/2013	2.7	4.21 d	4mg/4mg Alternate Days	2 wk		4mg, 4mg, 4.5mg	
Tue 25/06/2013	3.5	4.21 d	4mg/4mg Alternate Days	3 wk		4mg/4mg/4.5mg alt days	
Tue 04/06/2013	3.1	4.21 d	4mg/4mg Alternate Days	3 wk		4mg/4mg/4.5mg	
Tue 21/05/2013	3.0	4.21 d	4mg/4mg Alternate Days	2 wk		4mg/4mg/4.5mg	
Tue 14/05/2013	3.4	4.21 d	4mg/4mg Alternate Days	7 d		4mg/4mg/4.5mg	
Tue 07/05/2013	3.7	4.21 d	4mg/4mg Alternate Days	7 d		4mg/4mg/4.5mg alternating	
Tue 30/04/2013	3.3	4.21 d	4mg/4mg Alternate Days	7 d			
Tue 16/04/2013	2.4	4.21 d	4mg/4mg Alternate Days	2 wk			
Tue 09/04/2013	2.5	4.21 d	4mg/4mg Alternate Days	2 wk			
Tue 02/04/2013	4.3	4.21 d	Take 3.00 mg for 3 days then 7d then 4mg/4mg/4.5mg altern				



Risk class	Paediatrics Hosp
Pref. clinic	Paediatrics Tuesday (HOSP)
Phone	- home
Trt. plan	AC: 16/07/2010 active
In range	75% (Since 17/09/2012)
Diagnosis	Mitral Valve Replacement
Risks	
Age	3
Target range	Target 3.00 (2.5 - 3.5)
Anticoagulant	Warfarin half Mg Tablets
Start date	16/07/2010
Duration	Indefinite

Risk class highlights whether patients have their INR taken in hospital or at home using a CoaguChek machine

Blood tests at Children's Outpatients, HRI
Call lab for results: 01482 875875 ext. 607777
Direct number for results: 01482 607777
Referral from Hull, under [redacted]
Contact No. 07919555005 - maternity leave from March 2013

Information on who to contact for INR result or other important information

- Paediatrics - Brown Jennifer 30/08/2013 10:49
[redacted] well, looks like 1.5mg/2mg alternating might be too much so reduced to three day alternating and recheck in 10/7
- Paediatrics - Brown Jennifer 20/08/2013 10:23
[redacted] much better the last couple of weeks. Dad says he's off his food a little bit but he thinks he's just being picky. Looks like he might just need to go back on alternating dose now he's finished abx and is feeling better. Recheck 1/52 to ensure back in range
- Paediatrics - Cunliffe Helen 13/08/2013 10:03
dose kept same but review in one week
- Paediatrics - Kasuji Summayyah 06/08/2013 11:21
Otherwise well
- Paediatrics - Brooks Teresa 30/07/2013 10:47
Amoxicillin stop 1 week ago

Comment box for relevant information relating to that appointment's dosing

	Date	INR	Dose	Dosing instructions	Time	DNA	In range	Comments
	Tue 24/09/2013	0.0	0.00 d					
	Tue 10/09/2013	2.8	1.71 d	1.5mg/2mg Alternate Days	2 wk			1.5mg/1.5mg/2mg alternate
▼	Fri 30/08/2013	3.5	1.71 d	1.5mg/2mg Alternate Days	7 d			1.5mg/1.5mg/2mg
	Tue 20/08/2013	2.4	1.71 d	1.5mg/2mg Alternate Days	7 d			
▼	Tue 13/08/2013	2.9	1.43 d	1.5mg Daily	7 d			
	Tue 06/08/2013	4.8	1.43 d	Take 1.00 mg for 2 days, then: 1.5mg Daily	7 d			
▼	Tue 30/07/2013	4.0	1.71 d	1.5mg/2mg Alternate Days	7 d			
	Tue 16/07/2013	3.0	1.71 d	1.5mg/2mg Alternate Days	2 wk			
	Tue 02/07/2013	3.3	1.71 d	1.5mg/2mg Alternate Days	2 wk			
▼	Tue 25/06/2013	3.4	1.71 d	1.5mg/2mg Alternate Days	7 d			
	Tue 18/06/2013	2.1	1.71 d	1.5mg/2mg Alternate Days	7 d			
	Tue 11/06/2013	2.3	1.43 d	1.5mg Daily	7 d			
	Tue 04/06/2013	2.3	1.43 d	1.5mg Daily	7 d			TonightTues, 1.5mg, and eve
	Tue 14/05/2013	2.7	1.43 d	1.5mg Daily	3 wk			1.5mg M,W,F,S,S 1mg Tu,T
	Tue 23/04/2013	2.9	1.43 d	1.5mg Daily	3 wk			1.5mg Mon, Wed, Fri, Sat, S
▼	Tue 09/04/2013	2.6	1.43 d	1.5mg Daily	2 wk			1.5mg Mon, Wed, Fri, Sat, S

Any dosing information outside
the dosing algorithm is written in
the comments section

Benefits of Using DAWN AC (v7.6)



- Up to date record of anticoagulation history
- Documentation of all INRs and dosing recommendation
- Written communication to GPs and parents/carers
- Formal follow up arrangements
- Audit

Limitations of Using DAWN AC (v7.6)



- Unable to distinguish between adult and paediatric patients
- Dosing
 - Adult algorithm
 - Warfarin half mg regime doesn't allow alternate daily dosing >5mg
 - Can't do three day alternating regime
 - Therefore not recorded on letter, have to alter by hand
 - Only acknowledges tablet preparation, not suspension (not used at LTHT)
- Frequency of testing
 - Not always appropriate for paediatrics
- Concomitant medication
 - Not always listed
- Transition to adults
- Communication with external systems
 - Admissions
 - Payment

The future...



- We would like:
 - Paediatric dosing algorithm
 - DAWN AC to be able to separate paediatric and adult patients
 - Communication with other computerised systems
- What we will do:
 - Increase pool of independent prescribers
 - Publish our experiences to promote the use of computerised dosing systems