Monitoring Therapeutic Levels

National Prescribing Service Data

The ‘average’ General Practitioner writes 130 ‘Opioid’ analgesic scripts a year

60+ Panadiene Forte

30+ Tramadol

Less than 3 scripts/month are S8

Rationale for Blood Monitoring

Blood monitoring is used to assess if

Medication is being taken appropriately
Medication is being taken at all
Medication is in ‘therapeutic’ range
Medication is ‘dependent’ range

Ms M.B.

34 year old single mother with 2 children

Sustained an injury at work

Smokes 20/day

Rarely drinks alcohol

No significant hobbies or activities

Presenting History

1999 - back injury/repetitive strain

Workers Compensation claim settled but dissatisfied with the outcome

Treated 2-3 times a year with spinal cortisone injections since injury

Secondary depression,

Opioid dependence

Morphine Monitoring

Date: Time	Blood Morphine	Medication
03/03/04 n/a	9ng/ml	Kapanol 100mg bd
21/05/04 09.35	**610ng/ml**	**Kapanol 200mg bd**
21/05/04 13.40	**320ng/ml**	**Kapanol 200mg bd**

Results in bold are supervised doses.

Outcome

Admitted injecting medication

Relatives known Opioid abusers

Persistent prescription-shopper

Refused transfer to Opioid Substitution

Treatment ceased

Mr J.N.

50 year old married with 2 daughters

Disability pensioner

Smokes 6 rollies a day - less post infarct

Non-drinker - ceased after pancreatitis 2000

Presenting History

1994: Back pain, disc bulge present

conservative therapy.

Pain clinic investigations

positive response to Opioid therapy.

Pancreatitis 2000 from excess alcohol

Hep C +ve

from a blood transfusion before 1990 or childhood tattoo in Europe.

Cirrhosis

recurrent upper quadrant pain requiring injections of morphine

Presenting History

Suicidal from Pain

Prior overdose of Benzodiazepines.

Oesophagitis

Sleep apnoea

diagnosed 2001, CPAP effective.

Hypertension & Myocardial Infarct

Stent 2001

Numerous fractures

Motor Vehicle Accidents - no compensation involved.

Initial Morphine Monitoring

Date: Time	Blood Morphine	Medication daily dose
06 June 17.00	Nil	Ms Mono 360mg
07 June 08.30	24ng/ml	Ms Mono 360mg
07 June 12.00	172ng/ml	Ms Mono 360mg
10 July 11.15	9ng/ml	Ms Mono 360mg
01 August	528ng/ml	Ms Mono 480mg
07 August pre	36ng/ml	Ms Mono 480mg
07 August post	49ng/ml	Ms Mono 480mg

Background

Collecting full script monthly

He was often in pain

He used extra medication most months

Breakthrough pain was common

Transferred to daily collection

Daily Morphine Collection

Date	Time	Blood Morphine	Medication Daily dose
19 Feb	08.45	82ng/ml	Kapanol 300mg
19 Feb	post	96ng/ml	Kapanol 300mg
06 April	07.55	78ng/ml	Kapanol 400mg
06 April	12.30	115ng/ml	Kapanol 400mg

Follow up

Changed to Ms Mono to allow once daily dosing with no loss of pain control

Mr J.N. was unhappy collecting daily

He ‘always takes his medication correctly’

He felt like a ‘drug addict’

Successfully pressured to resume weekly collection

Weekly collection

Date: Time	Blood Morphine	Medication Daily Dose
04 May	< 10ng/ml	Ms Mono 420mg
24 May	170ng/ml	Ms Mono 420mg
09 June 08.40	**77ng/ml**	**Ms Mono 420mg**
09 June 18.15	**222ng/ml**	**Ms Mono 420mg**

Supervised doses.

Daily collection resumed

Date: Time	Blood Morphine	Medication Daily Dose
14/06/05:13.30	63ng/ml	Ms Mono 420mg
14/06/05:20.30	112ng/ml	Ms Mono 420mg
29/12/05:20.00	114ng/ml	Ms Mono 420mg
30/12/05:08.00	114ng/ml	Ms Mono 420mg

Discussion

Mr JN denies ever varying the consumption of his medication

His wife says he collects his script takes most of the medication, then goes into withdrawal

He then attends the emergency department for relief of his ‘pain’

Outcome

Transferred to Durogesic 150mcg/hour

Pain resolved

Fentanyl levels – therapeutic & stable

Returned to GP for on-going prescribing

Resumed chaotic management

Started on Methadone Maintenance

Mr C.S.

47 year old single male with one adult son

Disability pensioner

Non-smoker

Non-drinker

No hobbies or activities

Presenting history - Mr C.S.

Withdrawal fits from Tramal or Benzodiazepine
Fractured lumbar spine in MVA
    T12, L1, L4, L5 80% loss of anterior height T12
Chronic pain
Depression
Pain Clinic assessment 1994
Treated with various opioids including methadone.
No significant relief

Mr C.S.

Date: Time		Blood Morphine	Medication
17/10/04	10.30	6ng/ml	Ms Mono 240mg
19/10/04	**16.30**	**8ng/ml**	**Ms Mono 240mg**
20/10/04	**01.30**	**3ng/ml**	**Ms Mono 240mg**
20/10/04	**11.20**	**25ng/ml**	**Ms Mono 240mg**

Bold Supervised

Issues

In constant pain

Not obtaining therapeutic levels

A reasonable doses of Morphine

Methadone had also offered no relief

Blood methadone levels were not taken

Outcome

Transferred to Buprenorphine S/L 2mg die

Greatly improved pain relief

Transferred to Norspan 20mg patches

Dose increased to 2*20mg Norspan weekly

Or

About 1mg S/L Buprenorphine daily

Pain controlled

Therapeutic Blood Monitoring
Is it Worth The Effort?

Therapeutic monitoring is an additional tool

It provides information for interpretation

It raises questions

- If the medication is NOT there, why not?
- Why is it varying so much?

Levels vary over time and the reasons may be obvious (or not)

What benefit will be achieved with an increase/decrease in dose?

Recent additions to Blood Monitoring

Fentanyl, Hydromorphone levels are readily available

Ranges are being developed

Morphine and Methadone have consistent therapeutic ranges

Blood levels are most useful with stable delivery systems

Morphine/Methadone/Fentanyl are available in sustained release preparations

Problems

Blood monitoring is not suitable for short acting agents

- Anamorph, Oxycodone etc

http://www.painworld.zip.com.au/articles/treatment_of_chronic_non_cancer_pain.html

Features of Addiction	
More Predictive Features	
Multiple episodes of prescription loss	Selling prescription drugs
Repeatedly seeking prescriptions from other physicians or emergency departments without informing the prescriber or after warnings to desist	Prescription forgery
	Stealing or borrowing drugs from others
	Injecting oral formulations
Evidence of deterioration in function, at work, in the family, or socially that appear to be drug related	Obtaining prescription drugs from non medical sources
Repeated resistance to therapy changes despite clear evidence of adverse physical or psychological effects from the drug	Concurrent abuse of alcohol or illicit drugs
	Multiple non-sanctioned dose escalations

http://www.painworld.zip.com.au/articles/treatment_of_chronic_non_cancer_pain.html

Less Predictive Features	
Aggressive complaining about the need for more drugs Drug hoarding during periods of reduced symptoms Requesting specific drugs	Openly acquiring similar drugs from other medical sources Unsanctioned dose escalation Unapproved use of the drug to treat other symptoms