

AACB Toxicology Forum

Workplace Testing Experiences

Dr Benjamin Davies PhD BSc (Hons)
Senior Toxicologist
Chemical Pathology



Quality Pathology supporting Training and Research

SA Pathology Institute of Medical & Veterinary Science Royal Adelaide Hospital Campus

Toxicology Laboratory
AS/NZS 4308:2008



Quality Pathology supporting Training and Research

Urine Toxicology

Medical Testing – SA & NT (RDH & Alice Springs)

- Less restrictive than AS/NZS 4308:2008
- Hospitals & GPs
- Drug clinics eg Warinilla
- Drugs of Dependence Unit

Contract Testing – AS/NZS 4308:2008

- Commercial clients eg mining
- Government clients eg Driver Assessment Clinic, Families SA

AS/NZS 4308:2008 + Buprenorphine + Methadone

- Department of Correctional Services
- Drug Court



IMVS

Quality Pathology supporting Training and Research

Urine Immunoassay Screening

- 13 CEDIA® & DRI® Assays
- Creatinine & adulterants
- Oxycodone to be added
- Qualitative or semi-quantitative?
- Ranitidine or methamphetamine?
- Naloxone or morphine?



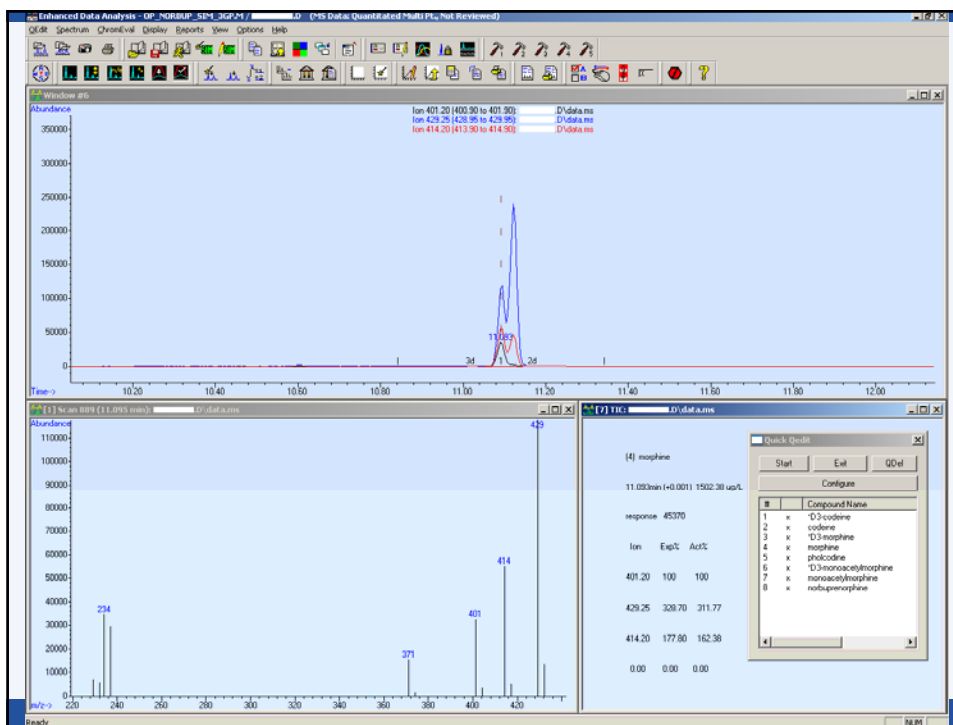
IMVS

Quality Pathology supporting Training and Research

GC/MS Confirmation Forensic Gold Standard



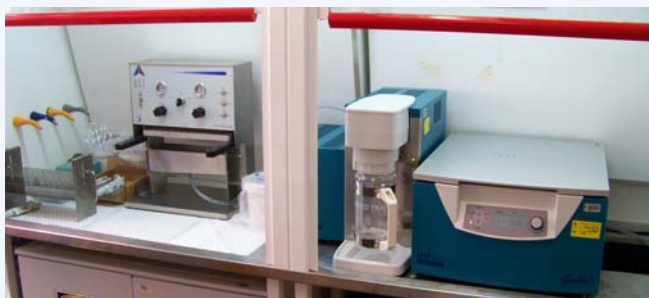
Quality Pathology supporting Training and Research



GC/MS Sample Throughput



- Validated sample preparative methods
- Instrument training and consumables
- Necessary site preparation



Quality Pathology supporting Training and Research

GC/QQQ

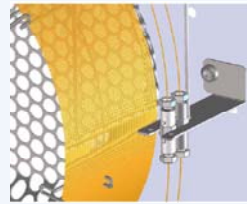
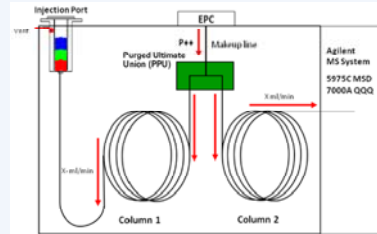
- Increased selectivity of tandem MS
- Provides the specificity to quantitate similar analytes simultaneously
- Not always possible by GCMS
- Potential to increase sample throughput
- Agilent 7000 Triple-QQQ MS & 7890A GC



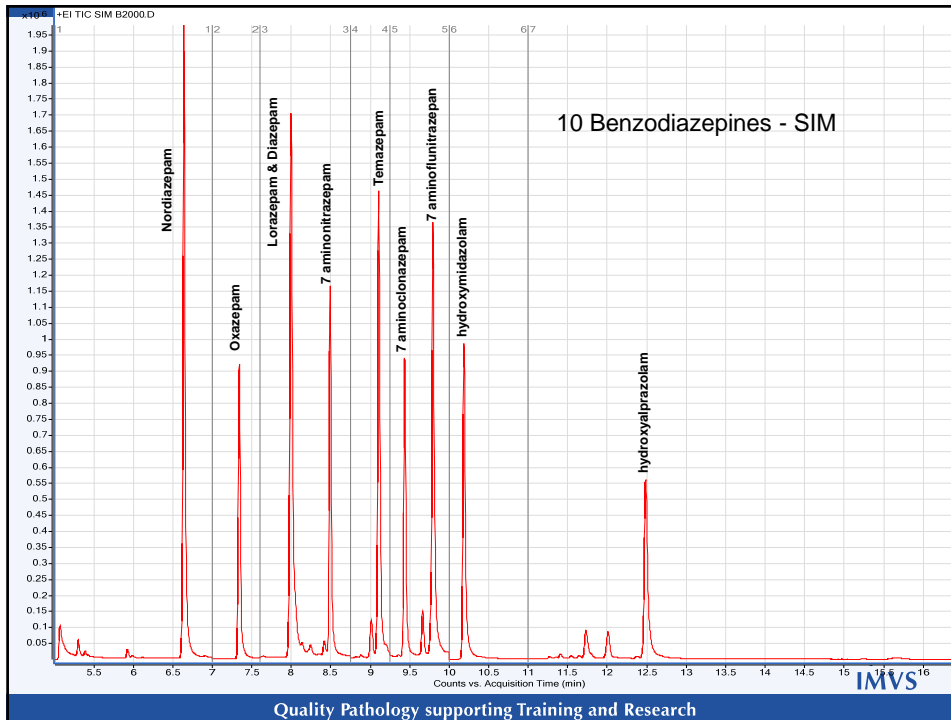
Quality Pathology supporting Training and Research

Column Backflushing

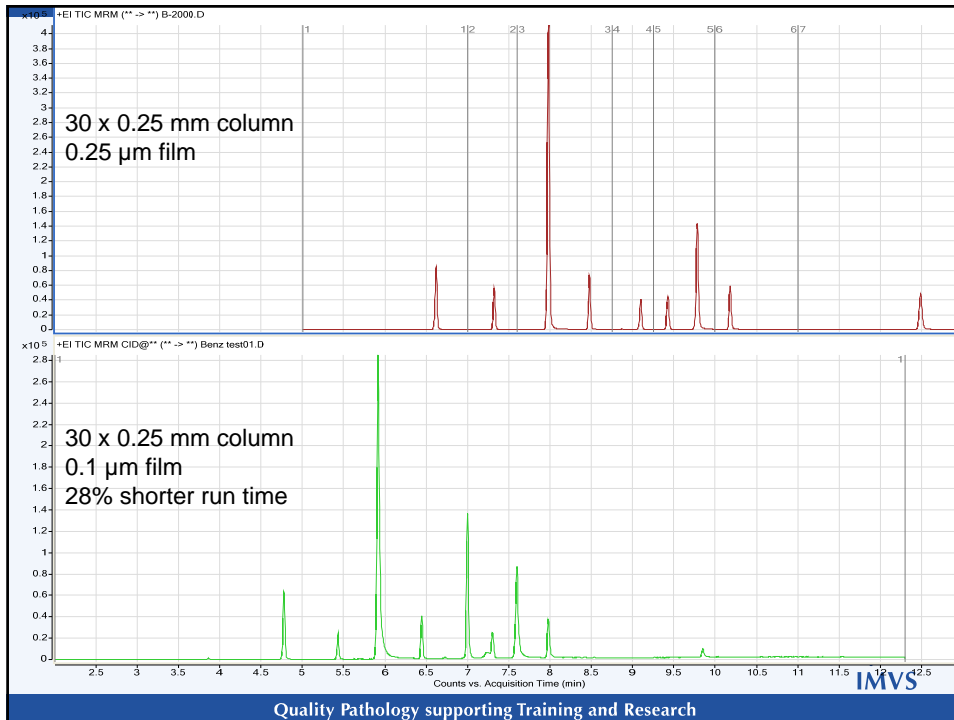
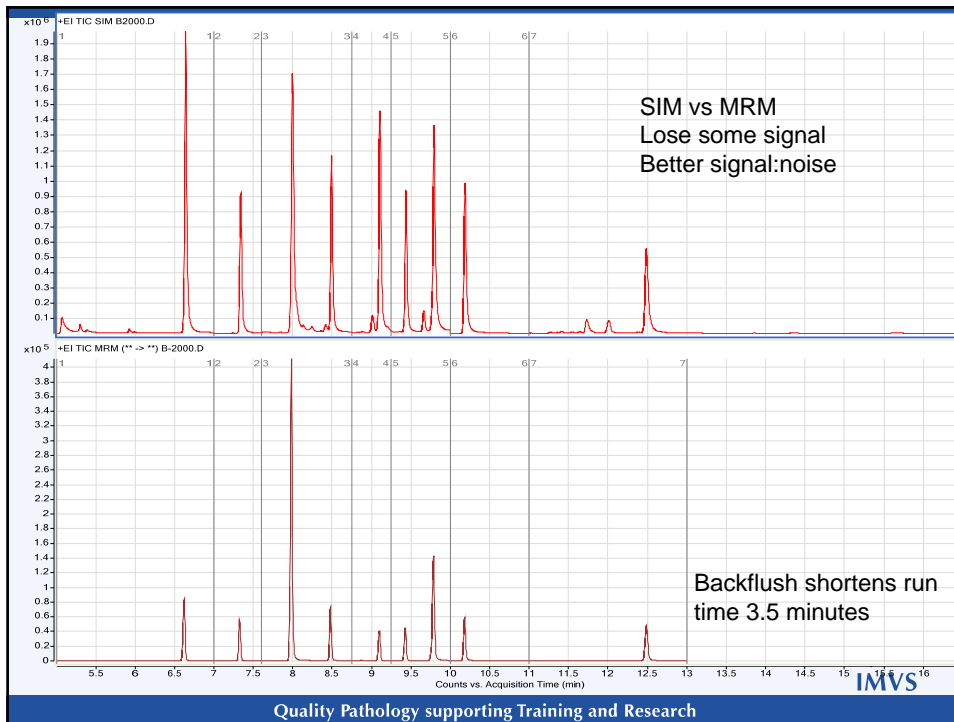
- Two HP-5MS columns joined using a purged inert tee-piece
- Auxiliary electronic pneumatic control module supplies a 2nd source of He₂
- Prevents late eluting compounds contaminating the ion source and shortens run times
- A second ultimate union connects the first column to the inlet with a deactivated retention gap

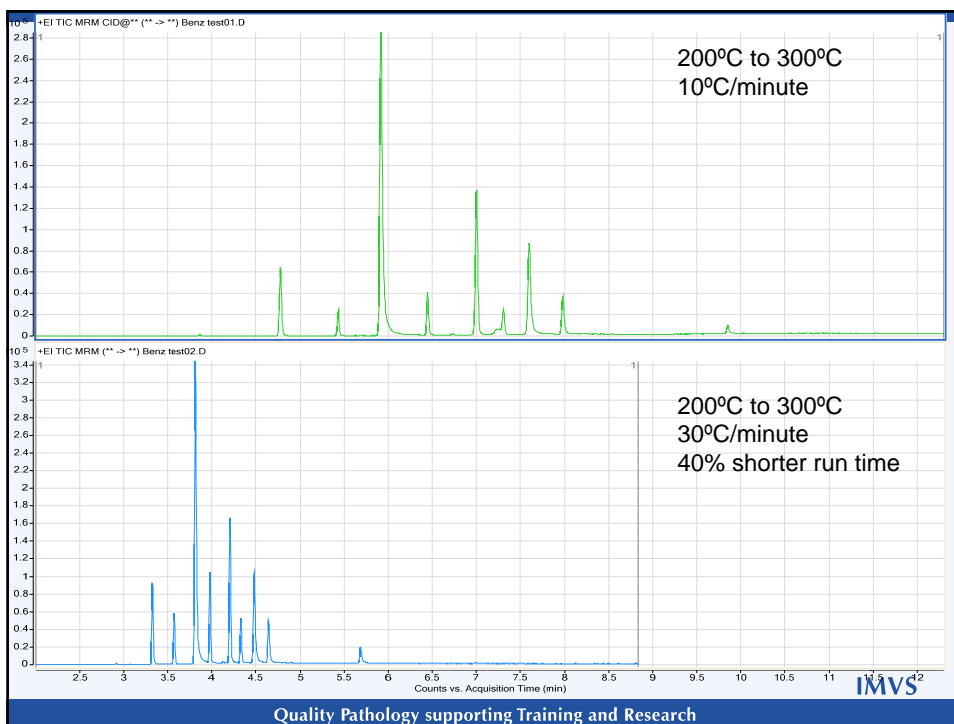


Quality Pathology supporting Training and Research



Quality Pathology supporting Training and Research





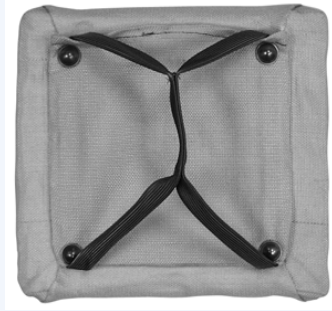
Oven Ramp Rates

Temperature Range	Old Models 6890		New Models 7890	
	Without insert	With insert	Without insert	With insert
50 to 70	75	120	120	120
70 to 115	45	95	95	120
115 to 175	40	65	65	110
175 to 300	30	45	45	80



Quality Pathology supporting Training and Research

Oven Insert



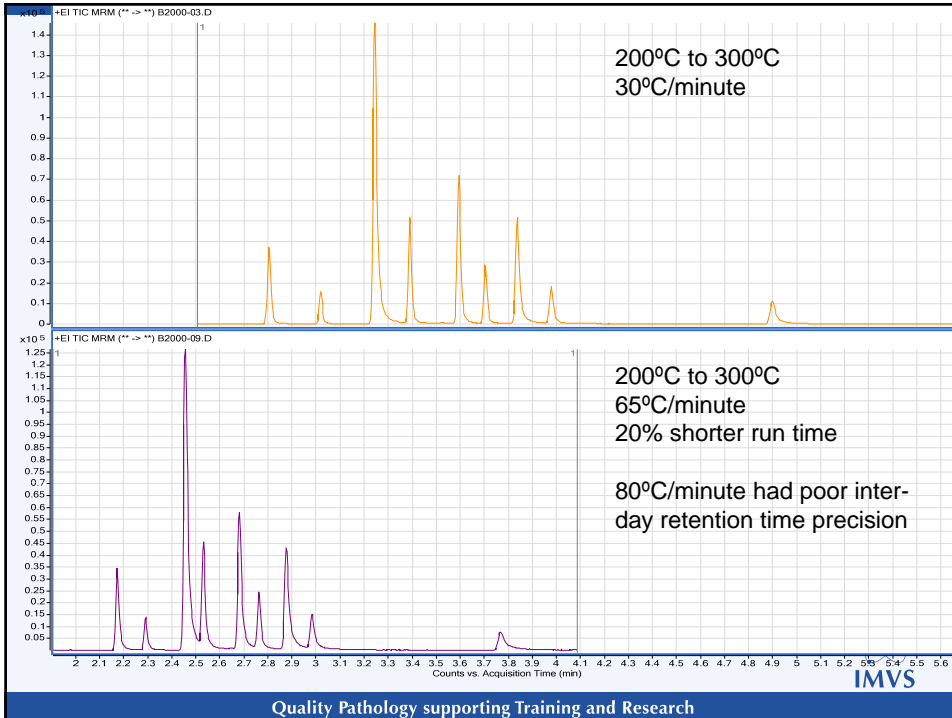
Front



Back

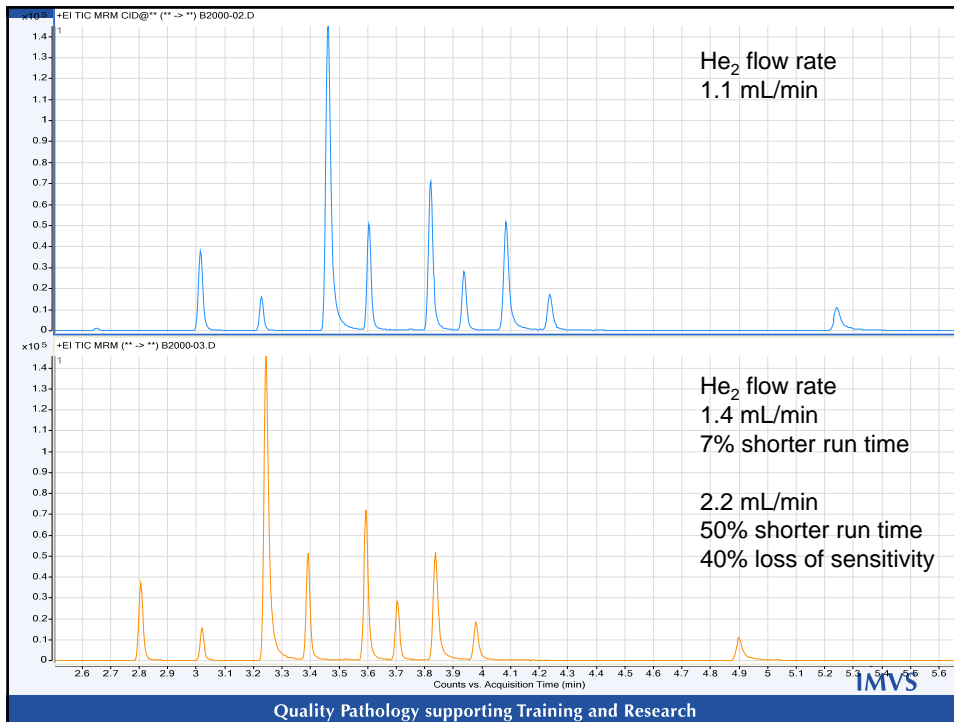


Quality Pathology supporting Training and Research



Quality Pathology supporting Training and Research





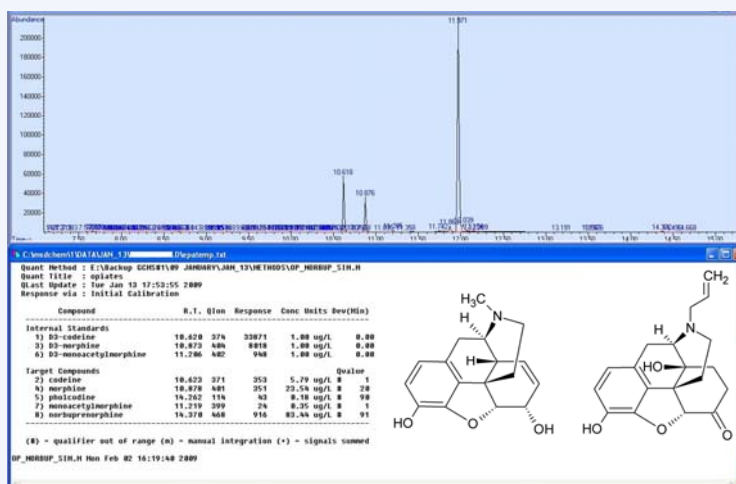
GC/QQQ & AS/NZS 4308:2008

- Assays were developed for all compounds listed in Section 5 of AS/NZS 4308:2008
- Retention times for all compounds are less than four minutes
- There was no improvement in the signal to noise ratio for carboxy-THC or buprenorphine
- Sometimes SIM says something more...



Quality Pathology supporting Training and Research

Suboxone – False Opiate Positive Screen



Quality Pathology supporting Training and Research

7890A/5975C GC/MS



Quality Pathology supporting Training and Research

benjamin.davies@health.sa.gov.au



Quality Pathology supporting Training and Research