



Forensic Science Regulator
O v e r s e e i n g Q u a l i t y

QUALITY MANAGERS CONFERENCE

4th February 2014

Birmingham

<https://www.gov.uk/government/organisations/forensic-science-regulator>

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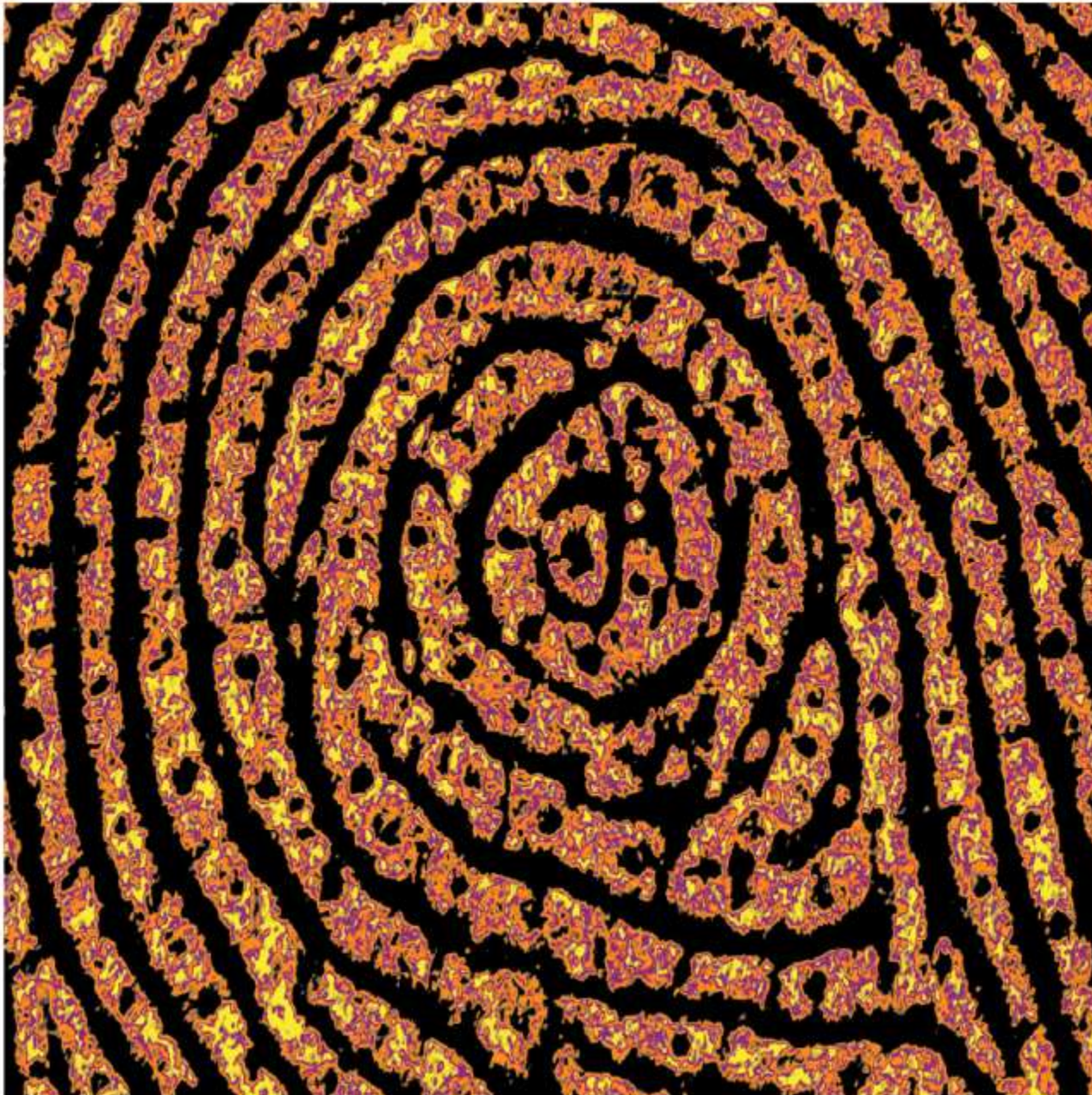


Forensic Science Regulator

O v e r s e e i n g Q u a l i t y

Quality Mangers Conference Breakout Session 1

Fingerprints		Chair: Gary Pugh OBE
13:10	Manual of Fingermark Enhancement	Dr Helen Bandy
13:30	Fingermark Enhancement Validation or Verification?	Kenny Laing
13:45	Approach to Fingermark Enhancement Validation and Beyond	Robert Bone
13:55	Discussion	
14:05	Fingerprint Comparison Standard - Interactive iPad session	Gary Pugh /June Guinness



Home Office

Fingerprint Visualisation Manual



Presented by:

Dr Helen Bandey
Editor

Fingermark Visualisation Manual

A re-positioning – Why?

The Current Manual



- Good for 27 years: is it still fit-for-purpose?
- Same style and approach since 1986
 - Hard copy only; no images
 - ‘this way or no way’
 - Limited background information
- Not particularly ISO 17025 friendly
 - Language
- Integrated Forensics
 - Almost no information
- Technical content out-of-date
 - And difficult to keep up-to-date

Fingerprint Visualisation Manual

Key changes

- Promotes good practice by those involved in the use of fingerprints
 - Predominately FLOs but equally applicable to CSIs
 - Also sections relevant for Identification staff, Photographers, CSMs etc.
- More emphasis on the integration of fingerprint evidence recovery with other forensic disciplines
 - Context
 - Awareness of other forensic disciplines
 - Communication and good planning

Fingermark Visualisation Manual

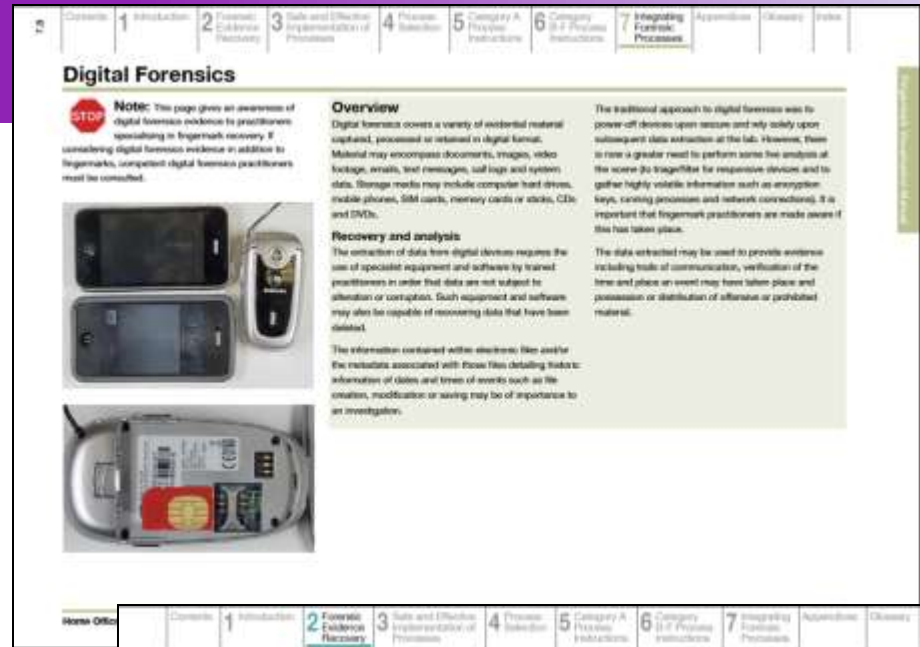
Key changes

- Compiled for those seeking (or already have) ISO 17025 accreditation
 - BUT it is not an ISO 17025 Manual!
 - Big emphasis on **competence** for (1) planning, and (2) execution
 - More background information
 - Offers less 'prescriptive' solutions, instead offers guidance and advice for confident decision making
 - More routine and non-routine processes with enough information for informed choices
 - Generic process instruction for routine processes will assist in writing local instructions

Fingerprint Visualisation Manual

Format and Style

- Interactive pdf
 - Fully functional on PCs and Macs and some tablets
 - Interactivity limited on some tablets
- Layout suitable for printing
 - >900 pages
- Visually more appealing
 - Use of colour
 - Flow diagrams
 - 1000 images
 - 140 diagrams



Fingermark Visualisation Manual

Chapters

NEW

Chapter 1

About this Manual

NEW

Chapter 2

Forensic Evidence
Recovery

REVISED

Chapter 3

Safe and Effective
Implementation of
Processes

REVISED

Chapter 4

Process Selection

REVISED

Chapter 5

Category A
Processes

NEW

Chapter 6

Category B-F
Processes

NEW

Chapter 7

Integrating
Forensic Processes

NEW

Appendices

Case Studies;
Fingermark
Research



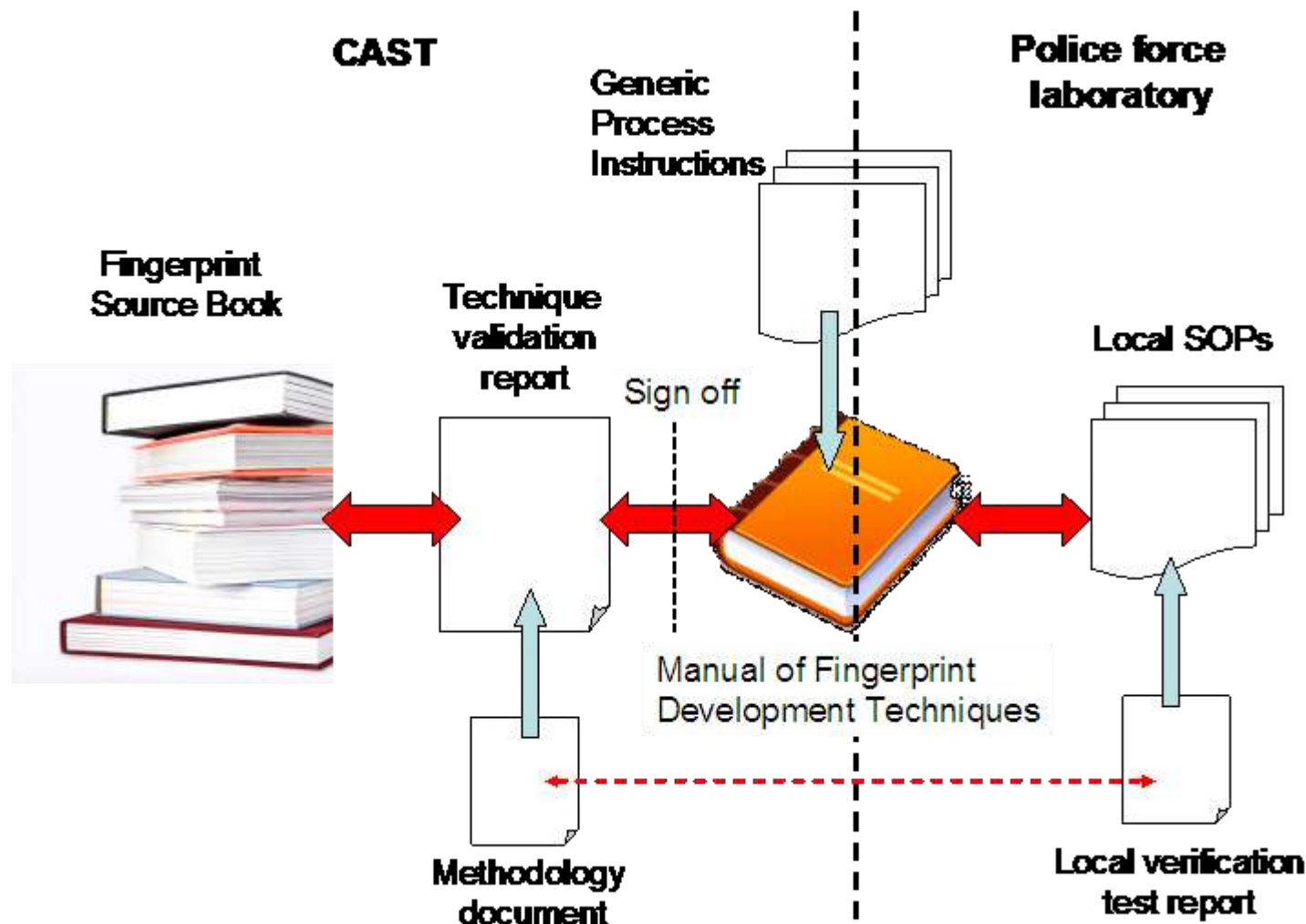
Fingermark Visualisation Manual

Implementation

- 15th/16th Dec & 26th Feb 'Train the trainers' (CoP & Met Police)
- 29th Jan Formal launch event
- 31st Jan Copies sent to Police Forces (free)
- 31st Jan Available for download (£300 + VAT)
- 21st Jan – 27th Mar Practitioner workshops
- 12th Mar National Quality Managers Meeting
- Easter Forensic Training Forum
- Apr → Webinar events on NCalt Live
- Apr → Incorporated into CoP training

Fingermark Visualisation Manual

The Manual and ISO 17025 Documentation



Fingermark Visualisation Manual

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West Midlands
West Yorkshire
Scottish Police
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National Crime Agency
College of Policing
Health and Safety Executive

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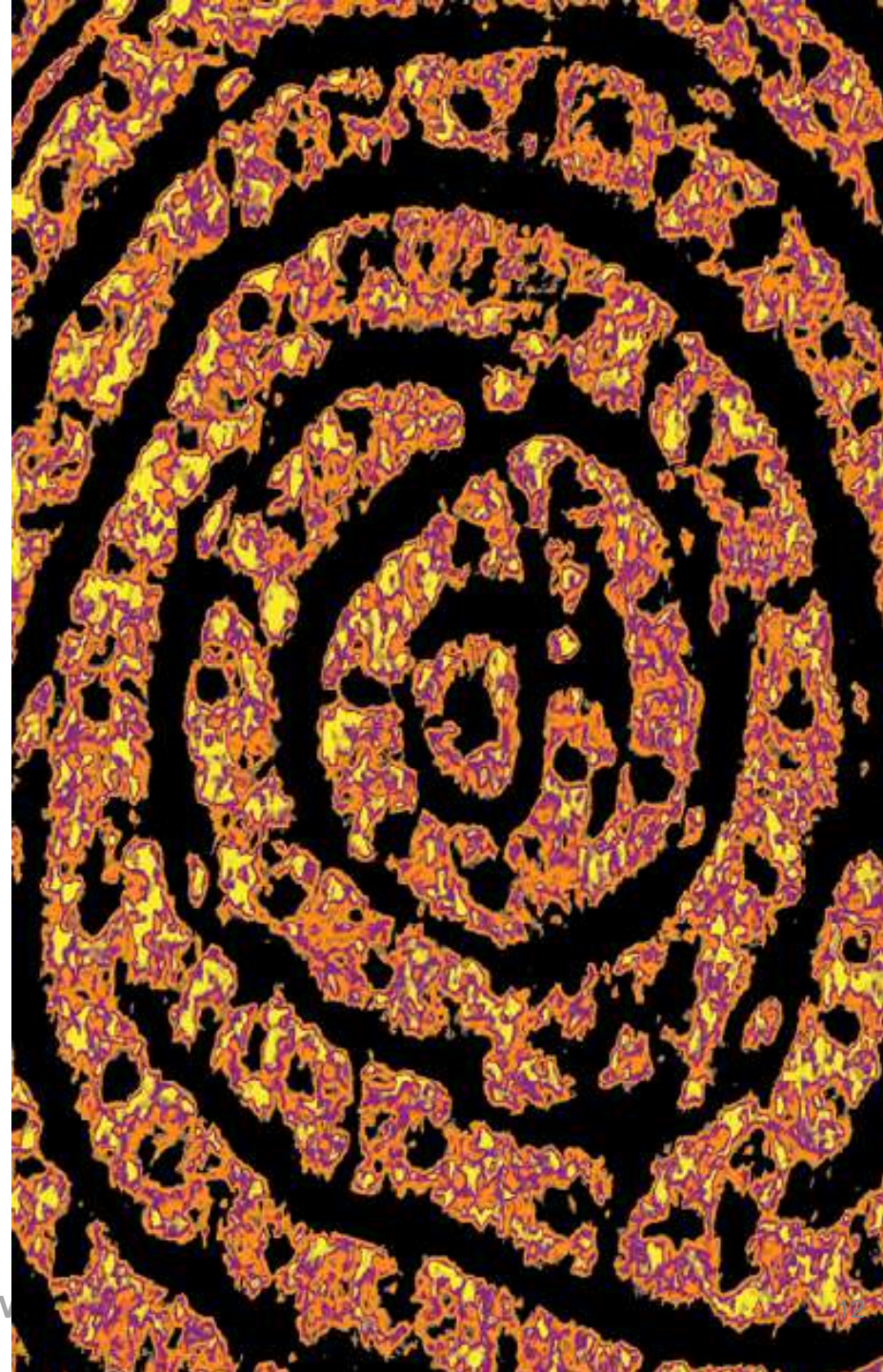
Fingerprint Visualisation Manual



Questions

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FORENSIC SERVICES

**SCOTTISH POLICE
AUTHORITY**

Fingerprint Enhancement Validation or Verification

**PRESENTED BY: Kenny Laing
4/2/2014**

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Team manager overseeing 4 Mark Enhancement Labs
Collaborative research

Well established Quality system in place

Working under 'Draft' SOP's

Rationalisation of service resulted in standardised methods,
Multi-site accreditation

Co-location

New build state of the art laboratory

Validation

FS-QUA-0017

Requirements for Standard and Non standard methods

Standard Methods

Verification?

If the method used is a standard test method, it can be considered 'validated' for its intended range of application. A standard method can be considered to be one which has been produced by some form of collaborative study, and has been ratified by a standardisation or regulatory body. For verification purposes, it should be demonstrated that the method is being applied in a correct manner by the laboratory using it.

when one of the Service Centres introduces a method already developed and validated by another Service Centre, a lesser extent of testing is required to verify they are capable of meeting the same performance.

Non Standard Methods

Validation

Validation Plan

Can include the following

Sensitivity

Reproducibility

Robustness

Limit of Detection

Environmental Constraints

Limitations of Applicability

Are Fingerprint Enhancement techniques standard methods??

Methodology for Validation

Substrate identification

Commonly encountered within casework for the method

Donor Identification

Range of sexes and ages to give 'Good' 'Medium' and 'Poor'

'Age'

Of fingermark to reflect SLA's and or common practice

Depletion

Less deposit

Move of premises January 2014

UKAS assessment visit August 2013

UKAS site visit for new premises December 2013 (January 2014)

Dual running of sites

Validation of new site

Decommission existing site, move and verify equipment

Superglue & BY40, Ninhydrin, Powder Suspensions (VMD)

4 donors per substrate

4 timescales 7, 14, 21 and 28 days (Donated on different days, all enhanced on same day)

10 Substrates for superglue Total 1600 prints

5 substrates for Ninhydrin Total 1400 prints (7 timescales)

15 substrates for VMD total 2400 prints

11 substrates for Powder Suspensions Total 1760 prints

Move of premises

Commission and validate equipment in new lab

Total time 200 FTE hrs (approx 7 weeks)

Substrate preparation for verification also

Full calibration of equipment by Manufacturer and internal processes

Preparation of reagents, Processing and assessment of substrates

Validation document

Move and Verify equipment from existing premises

Commissioning of equipment

Calibration of equipment

SG&BY40 6 substrates total 720 prints

Nin 4 substrates 480 prints

Powder Suspensions 6 substrates 720 prints

'Mock casework' 20 items per process (per machine)

Total time 28 FTE hrs (4 days)

Non accredited move of premises
Edinburgh and Aberdeen

Move and commissioning and small number of 'mock
casework' samples

Total time 14 hours (2 days)

Learning points

Team involvement

Interest in Quality system

Understanding of methods and there limits

Enthusiasm for job

Confidence in decision making

Interest in further 'validation'

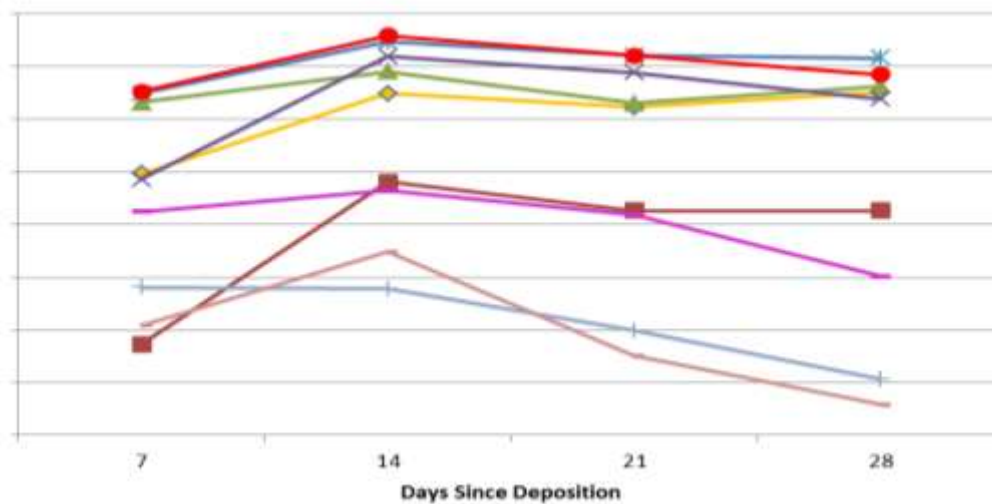
Multi site accreditation

LIES, DAMN LIES AND STATISTICS!!!!!!!!!!!

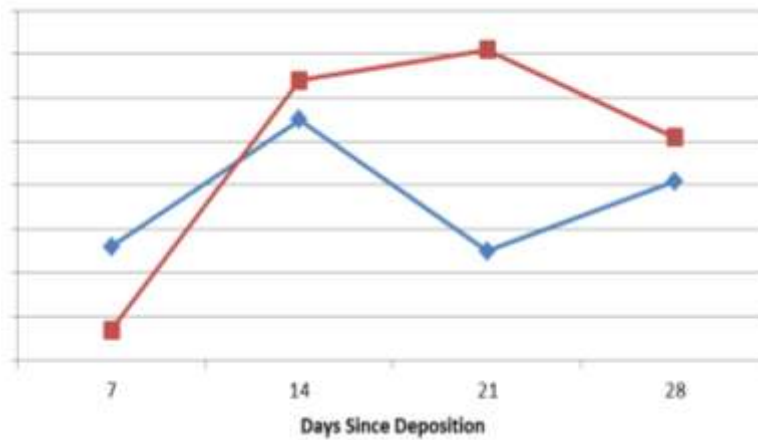
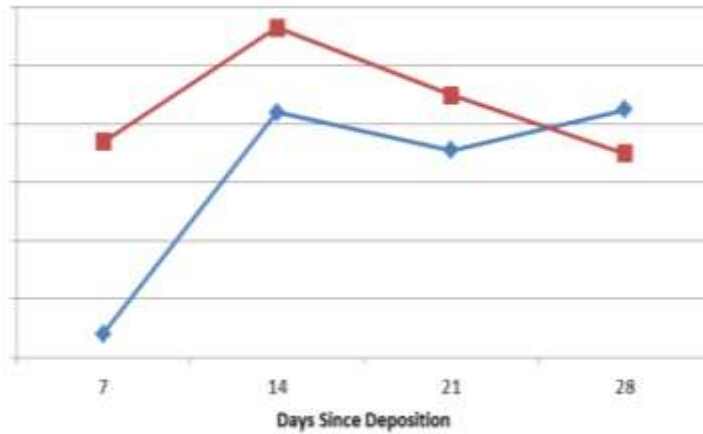
LIES, DAMN LIES AND STATISTICS!!!!!!!!!!!

MSc project to Validate Fluorescent Superglue.

Results compared SG&BY40, Polycyano UV



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Approach to Fingermark Enhancement Validation and Beyond

Robert Bone

Senior Forensic Scientist, West Midlands Police



CAST's ISO 17025 Fingerprint Work

Publication of the Fingerprint Source Book

- Accredited November 2012
- Request to demonstrate fit for purpose
- Thirteen processes validated
- Forces to produce local SOPs
- Local verification test reports for techniques.



Verification of Processes

- Process works in ‘our’ working environment
- Reflected in the SOPs
- Process works for marks deposited by a range of donors
- Process works for marks of different ages (storage)
- Process works for a ‘representative range’ of substrates of known & unknown history
- Identify critical parameters within the process and the equipment to monitor them.



Production of SOPs

- Standardisation of documentation format
- Standardisation on the 'measurement of uncertainty' for the critical parameters
- Controls
- Alternatives processes for non-standard exhibits
- Staff following them??



Strategy for donors

- Six volunteers: General health questioner for the donor
- Race, age, sex, height, weight & general wellbeing
- Diets: vegetarians, vegans, special dietary requirements
- Smokers/non smokers
- Do they consistently secrete??

Deposition Method

- Using established methods
- Parameters for donors prior to deposition
- Depletion series of 10 marks, sensitivity (8 used)

Depletion series coding									
1 Mark Start	2 Mark	3 Mark	4 Mark	5 Blank	6 Mark	7 Mark	8 Mark	9 Mark	10 Blank Finish

- Control marks eg l-alanine or saline solution for reproducibility
- Controlled environmental storage of substrates.

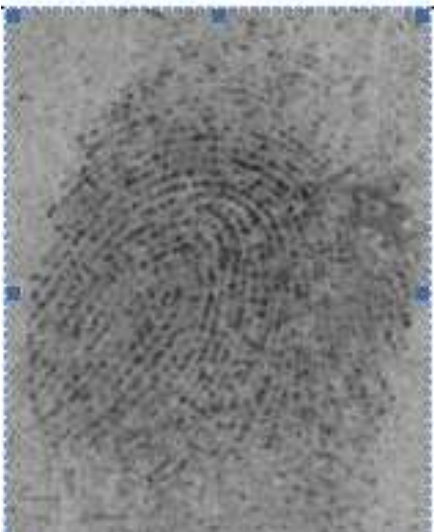
Testing

- Series one: Treated within 24hrs of deposition (urgent submission) and photographed
- Series two: Treated within 30 days to represent a month and photographed
- Continue for 12 months (13 sets of samples per donor per substrate)
- Each month review previous samples for any further enhancement
- Substrates of a known history (sourced appropriately)
- Substrates of unknown history (treated as per SOP)
- Control marks for competency testing & critical parameters

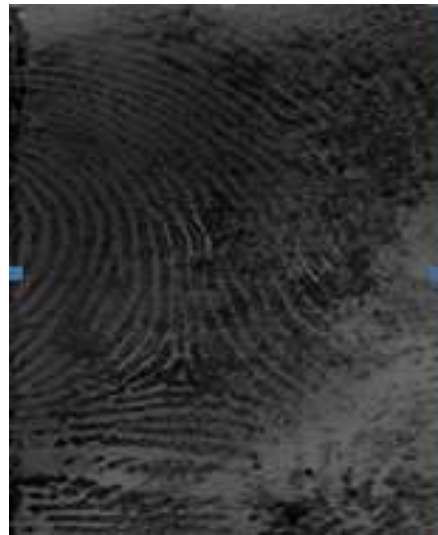
Comparing Marks

- Marks will be graded for quality from 1 to 5, as follows:

Grade 2



Grade 3



Grade 4



Grade 5





Review Critical Parameters

- Repeat process testing & vary the following:
- Ninhydrin: Humidity & Temperature
- Superglue: Humidity, loading within chamber, glue time
- Acid dyes: Contact times.

Fingerprint Comparison

- Known individuals have their fingerprints taken (initially 5-7)
- Similar general characteristics on each of their relevant digits
- Known individuals providing latent marks on representative substrates
- Record areas of finger/palm making contact
- Lifted marks (Powdered and lifted by FSI)
- Chemically treated marks (treated and photographed by Technician)
- Assess quality of individual marks (Partnership with forces)
- Select a number of Grade 1 to 4 marks for comparison purposes.



Proficiency Testing

- Individual from each force given 20 marks and 1 Fingerprint form
- Criteria: Identified, Excluded, Insufficient for identification & inconclusive
- Independent collation of results
- Review analysis notes & provide recommendations
- Critical parameters of the process: Time of day?
- Information collated for a database for each force
- Potential to provide declared trials between forces.



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Fingerprint Comparison - Interactive iPad

4th February 2014
Birmingham

Gary Pugh
Chair of the FQSSG

(report of outputs to be published separately)

REPORTING OUTCOMES

The Forensic Science Regulators Quality Standards Specialist Group have defined four outcomes following a fingerprint comparison:-

- Identified
- Excluded
- Insufficient
- Inconclusive

Q: What are the strengths and weaknesses of moving to reporting outcomes in this way?

ERROR

Error is defined as:

An outcome that is unexpected or wrong when the true answer is known. Errors can be categorised into various types, such as technical and administrative errors. If an error occurs then it can have a detrimental effect on the outcome of a comparison or search. There are various processes that can be used to minimise the different types of errors occurring, but these processes may vary from bureau to bureau.

ADMINISTRATIVE ERROR: *The incorrect data or information is recorded or assigned.*

TECHNICAL ERROR: *The incorrect result or reported outcome derived by the practitioner's judgment and opinion from the examination of the mark and print, e.g. a false inclusion /exclusion.*

Q: What are the issues that need to be addressed by the fingerprint profession to report and manage errors?

DIFFERENCE OF OPINION

In the second trial in the R V Smith case, the judge said in her summing up:

'One thing that is patently obvious from what you have seen and heard you may think is that fingerprint analysis is in the eye of the beholder. It is admittedly subjective. Experience no doubt sharpens the expert's powers of observation, but there is much room for differences of opinion between acknowledged experts. In this case, very unusually, you have fingerprint experts who are almost completely at odds with the interpretation of the other side. I have already given you directions about how to approach expert evidence. Your task is to determine which, if any, of either group of experts you accept'

Q: What should the process be for managing differences of opinion in fingerprint examination?



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End of breakout session

Remaining Agenda

Afternoon plenary (oral presentations only)

15:50	The court dependence on the quality of forensic science ¹	HHJ Andrew Goymer
16:15	Forensic Science Regulation	Prof. Bernard Silverman
16:20	Closing remarks	Andrew Rennison

¹Transcript available

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