# Quality Initiative In Pathology

# ‘Harmonisation of Laboratory Testing’

towards pathology harmonisation

# Harmonisation: what do we mean?

Agreement of test results irrespective of the method used or the testing laboratory

Requires:

- Common terminology and units of reporting
- Common reference intervals and clinical decision limits.

# Key drivers of harmonisation in pathology

## Safety Issues

- Medical referrers/ GPs not aware of methodological or unit reporting differences

## IT Issues and eHMR

- e-Health providers unaware of complex methodological problems in pathology testing

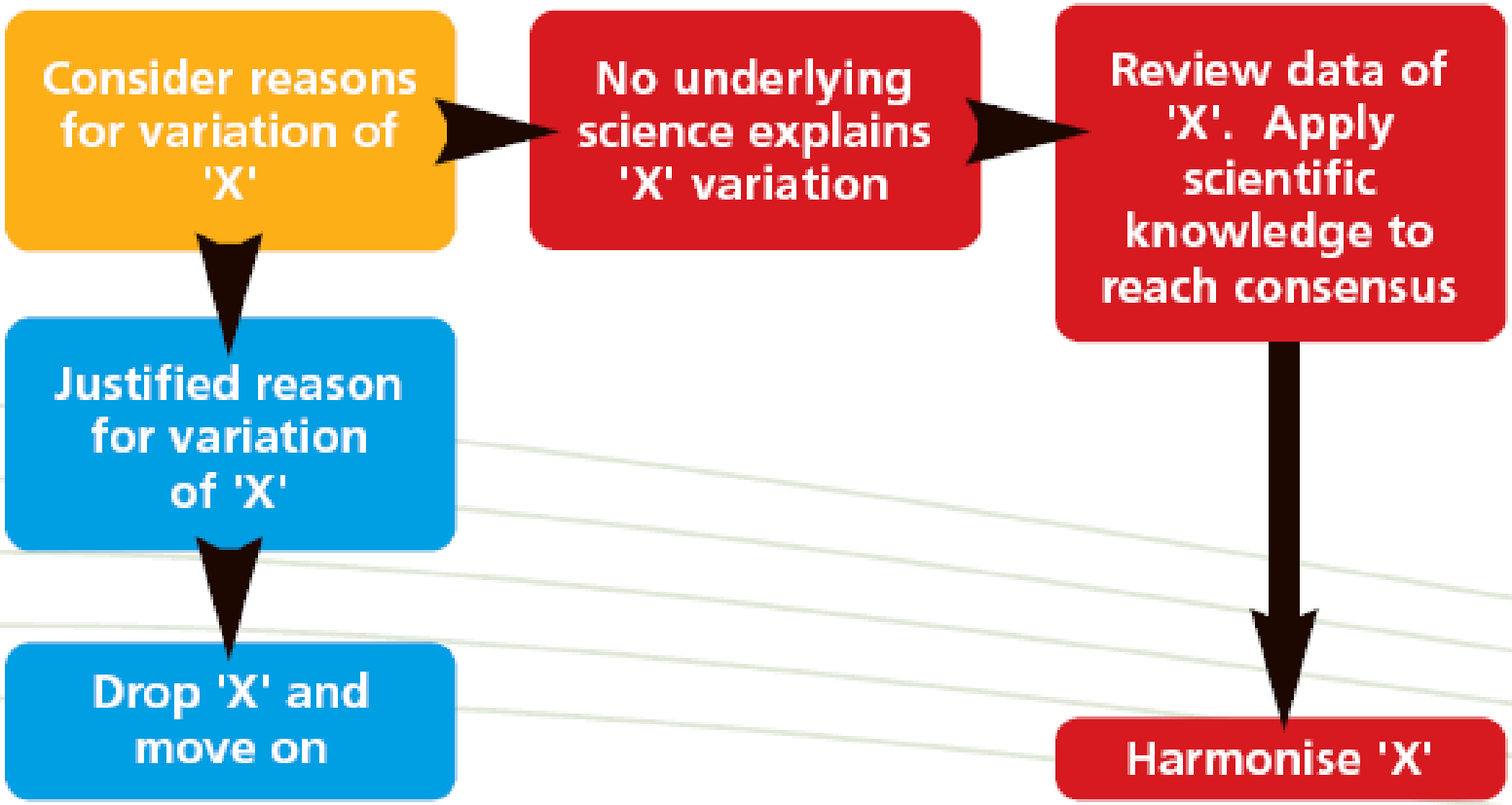
Potential for wrong result interpretation in both situations.

pathologyharmony.co.uk

working to harmonise standards in UK pathology

# Pathology Harmony - a method

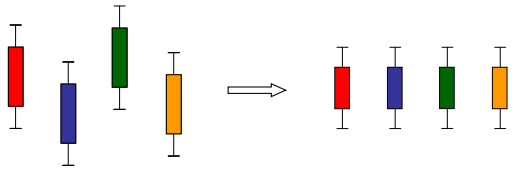
In 2007, during the Birmingham meetings a methodological approach to harmonisation gradually evolved. This is best shown by the following diagram.




Berg J, Lane V. Ann Clin Biochem 2011

# AACC Harmonization Initiative

*Harmonization.net*



- A global infrastructure and systematic approach for harmonization (and standardization) for all measurands is needed.
- The goal for the Steering Committee and Task Forces is to have an operational harmonization process in place by the end of 2012.
- Implementation of a comprehensive harmonization process will require the involvement and cooperation of all interested stakeholders.

# Key Harmonisation Activities in Australia

1. Standardisation of Pathology Units and Terminology (PUTS)
2. Harmonised Reference Intervals and Decision Limits
3. Critical Results – choice of key analytes and common communication processes
4. Best practice methodology for selection and adoption of laboratory guidelines for local use in Australia.

# Methodology

- Activities include:
  - Collation and dissemination of the evidence supporting the above
  - Setting up of working groups to collate the evidence
  - A Workshop to discuss the results with all Australian laboratories and aimed at reaching a consensus on common Reference Intervals
  - Support tools for laboratories to assist in implementation of harmonisation.

# Application of Stockholm Heirarchy to defining quality of RIs and clinical decision limits

| Level | Principle | Reference Limits | Common Interval |
|---|---|---|---|
| 1 | Clinical Outcome | Based on clinical outcome | Glucose, Lipids |
| 2A | Biological variation | 2.5%-97.5% distribution of reference population | NORIP (Direct)<br>SONIC (Indirect) |
| 2B | Clinician Survey | Based on survey of clinician response to results. | Troponin |
| 3 | Professional Recommendations | Based on Laboratory Experts. | ARQAG<br>SIQAG |
| 4 | Proficiency survey | Based on survey of common reference intervals used. | UK Harmony |
| 5 | State of the Art | Based on what is available. | Kit Insert |

Sikaris K. Clin Biochem Rev 2012;33 (November)

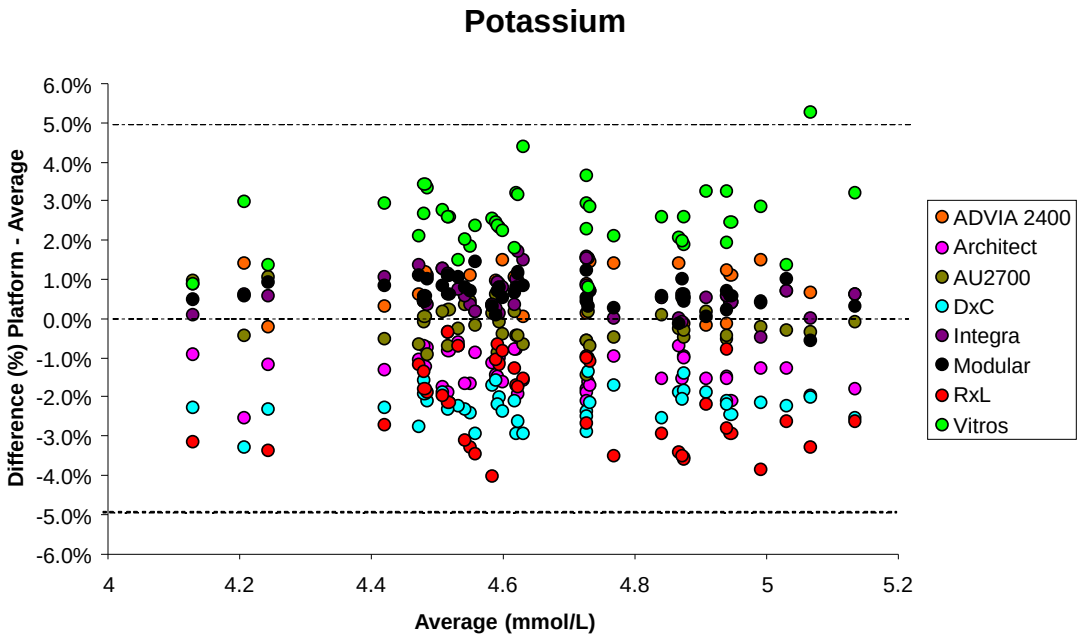
# Checklist for setting an RI

1. Define analyte (measurand)
2. Define assays used, accuracy base, analytical specificity
3. Consider important pre-analytical differences, actions in response to interference
4. Define distribution of RI values (e.g. central 95%)
5. Describe evidence for merging of RIs
   - data sources (literature, lab surveys, manufacturer)
   - data mining
   - bias goal as quality criterion for acceptance
6. Consider partitioning based on age, sex, etc
7. Define degree of rounding
8. Clinical considerations of the RI
9. Consider use of common RI
10. Document and implement.

Jones GD, Barker T. Clin Biochem Rev 2008;29 Suppl S93-97.

# Potassium

- Population RI
- mmol/L
- Assays both direct and indirect
- No expected methodological differences; analytically there are no differences
- Serum vs Plasma:
  - serum approx. 0.3 mmol/L higher
  - serum preferred sample for RI
- Pre-analytical: haemolysis indices to be harmonised
- Gender and age differences
  - URL all 5.0 mmol/L up to 80 y
  - URL up to 5.2 mmol/L for 80 y+
- Clinical consideration: RI based on healthy individuals not hospital patients
- Significant figures - to 1 decimal place
- **Proposed RI (regardless of pre-analytical conditions):**
  **SERUM 3.5 – 5.2 mmol/L**




| | |
|---|---|
| **Green** Bias would not prevent common reference intervals | a. All results fall within the RCPA QAP ALP for the analyte.<br>b. Regression line does not cross the RCPA QAP ALP within the current manufacturer quoted reference intervals. |

# Proposed Adult Reference Intervals

| Analyte | Male | Female |
|---|---|---|
| Calcium | 2.15 – 2.55 mmol/L | |
| Adjusted Calcium | 2.15 – 2.55 mmol/L | |
| Phosphate | 0.75 – 1.50 mmol/L | |
| Magnesium | 0.70 – 1.10 mmol/L | |
| LD [L to P] | 120 – 250 U/L | |
| Sodium | 135 – 145 mmol/L | |
| Potassium | 3.5 – 5.2 mmol/L (serum) | |
| Chloride | 95 – 110 mmol/L | |
| Bicarbonate | 22 – 32 mmol/L | |
| Creatinine | 60 – 110 μmol/L | 45 – 90 μmol/L |
| ALP | 30 – 110 U/L | |
| AST | <40 U/L | <35 U/L |
| ALT | <40 U/L | <30 U/L |
| Total Protein | 60 – 80 g/L | |

# Critical Laboratory Result Management

- A preliminary survey was conducted by AACB Critical Laboratory Results WG & RCPA QAP
- Part of this initiative is to establish a degree of concordance between critical tests, critical limits and reporting practices used by laboratories for common biochemistry analytes
- A systematic review of the literature was undertaken & a survey is pending in Europe
- Best practice recommendations are required to provide high quality and safe service to patients.

Campbell C & Horvath A. Clin Biochem Rev 2012;33 (November)

# HARMONISATION of LABORATORY TESTING – a global activity