Framework for quality of testing

- List of prequalified diagnostics
- Selection of testing strategy
- Validation of testing algorithm(s)
- Procurement of diagnostics
- Post-market surveillance

Guided by:
- National regulatory framework for diagnostics
- National testing and QA policies

Supported by:
- Training
  - Quality assurance

Basic principles

- Testing strategies and testing algorithms
- Test kits
- Specimen management
- QA
- Training
**Testing strategies/algorithms**

- **Testing strategy**
  - describes a generic testing approach for a specific need, e.g. transfusion/transplantation safety, surveillance of acute or chronic infection, and/or diagnosis of acute or chronic infection
  - takes into account presumed prevalence in the population being tested

- **Testing algorithm**
  - describes the combination and sequence of specific test kits used within a given testing strategy.
  - combinations of EIAs or combinations of RDTs or mixed combinations of EIAs and RDTs, or molecular technologies

**Testing strategies**

- Illustrative example testing strategy for chronic HCV seroprevalence

  - If Assay 1 and Assay 2
    - sensitivity $\geq 99\%$
    - specificity $\geq 98\%$
    - PPV of algorithm should be $\geq 99\%$

  - Result: $A_1^+; A_2^+$
  - Report HCV positive

  - Result: $A_1^+; A_2^-$
  - Result: $A_1^-; A_2^-$
  - Result: $A_1^-; A_2^-$
  - Report HCV negative

**Basic principles**

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- **Test kits**

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- Training
WHO Prequalification of In Vitro Diagnostics Programme

- Regulation specifically for in vitro diagnostics (IVDs) is often poorly understood and/or poorly enforced
- Increasingly production is out-sourced to countries with lower labour costs & less stringent regulatory oversight
- The WHO Prequalification of IVDs Programme independently evaluates the quality, safety & performance of diagnostics that are destined for sale and use in resource-limited settings

WHO Prequalification of In Vitro Diagnostics Programme

- Abbreviated PQ procedure where previous stringent regulatory review has been undertaken

WHO post-market surveillance

- WHO is developing guidance for both reactive and proactive post-market activities
- End-users must report quality issues to NRAs (and WHO)
- Manufacturers are obliged to carry out PMS activities – Including recalls
Test formats

- Rapid diagnostic tests to detect anti-HCV antibodies
  - Immunofiltration vs. immunochromatographic
  - Beware of different test procedures, ambiguous reading times, etc.

Test formats

- Enzyme immunoassays for detect anti-HCV antibodies and/or HCV antigen
  - Manual EIA
  - Random access analysers (multi-analyte)

Rapid diagnostic tests

- Use of rapid diagnostic tests for community based testing
- Simple procedure
  - Uses finger-stick blood or oral fluid
- Non-laboratory staff can be trained
- Rapid results
  - Incubation time ~ 5 to 30 minutes
Test formats

- Molecular technologies for confirmation of viremia
  - Quantitative HCV RNA validated for serum and plasma, not validated for DBS
    - COBAS® Amplicon®/COBAS® TaqMan® HCV Test
    - Abbott RealTime HCV assay
    - VERSANT® HCV RNA 1.0 Assay (kPCR)
  - HIV viral load assays on these platforms are already WHO PQed
- Need for simpler molecular technologies
  - Qualitative HCV RNA mostly used in blood screening, single or multiplex tests available

Test formats

- Need for simpler molecular technologies
  - Qualitative HCV RNA for confirmation of viremia and of cure

Basic principles

- Testing strategies and testing algorithms
- Test kits
- Specimen management
  - Specimen type
    - Serum, plasma, fingerstick whole blood, oral fluid, dried blood spot
      - Has manufacturer validated their assay for the specimen type
  - Specimen collection
    - Venous vs. capillary, skilled phlebotomist required?
  - Specimen processing, transport, storage
    - If serum/plasma, centrifugation & separation within 6 hours
    - Cool storage required but -20°C for periods longer than 5 days

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Quality assurance

- Using ISO 15189 and CLSI GP26-A4
- External quality assessment (EQA)
  - Verifies the proficiency of the testing process
- Quality Control (QC)
  - Verifies the test is working correctly

WHO guidance on quality assurance

- WHO and CDC are developing guidance on QA for HIV-related testing at POC
  - Also applicable to viral hepatitis
  - To be launched later in 2014
- WHO/CDC/CLSI training package on laboratory quality management system
  - http://www.who.int/ihr/training/laboratory_quality/en/
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Training and proficiency

- Competency-based training for RDTs
- Proof of proficiency with panel of HCV + and HCV - specimens
  - Proficiency for the entire testing algorithm, not just test procedure
- Simple SOPs
  - Easy to read job aids

Contact us

- Contact us by email
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- Sign up to our mailing list
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- Check our website
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