

## ***Expert Working Group – ‘FIT for Screening’***

### ***Short Discussion Document No. 6 – Quantitative FIT Procurement***

**Prepared by:** Prof Stephen Halloran, NHS Bowel Cancer Screening Programme Southern Hub, Guildford, UK (e-mail: [s.halloran@nhs.net](mailto:s.halloran@nhs.net)).

#### **Quantitative FIT Device Procurement**

The first section is a checklist to be used to help in the preparation of FIT procurement.

The second section is a series of recommendations that describe the information that should be requested from any company submitting a proposal to supply FIT.

Whilst the document has been developed primarily to aid the effective procurement of sample collection and measurement devices, it describes other facilities and services that might form part of a ‘system’ procurement.

#### **Definitions**

1. Sample collection device – *test kit as used by the invitee/participant.*
2. Measuring device – *analytical instrument and ancillary reagents and consumables as used by the laboratory.*
3. System – *sampling device, measurement device and other associated devices (a system could consist of a combined sampling and measurement device).*
4. Subject – *individual invited to be screened (invitee).*
5. Participant – *individual responding with a completed test kit.*

#### **Preparation Prior to Initiating Procurement Process**

##### **Determine Scope of Procurement**

1. Faecal sample collection device (usually provided in or with the test kit).
2. Haemoglobin measurement device (analytical instrument).
3. System redundancy/business continuity plan (additional instrument or alternative laboratory in case of system failure).
4. Service call-out and analytical problem resolution within a defined time period.
5. System maintenance at defined frequency.
6. System training (typically initial training repeated for new staff or cascade training).
7. Helpline telephone service to support use of collection devices *etc.*
8. Web-based Helpline pages to support use of collection devices *etc.*
9. FIT packaging suitable for distribution (programme or supplier designed).
  - i. Programme-specific artwork and textual information for FIT packaging.
  - ii. Participant FIT instructions for use.
  - iii. Printing of subject identification on sample collection device.
  - iv. Applying linkage between sample collection device ID (e.g. barcode) and subject, and uploading linkage details to screening programme information system.
  - v. Additional programme literature (letters, screening leaflets *etc.*).
  - vi. Faecal collection materials (e.g. toilet bowl collection system).
  - vii. Test kit distribution service (e.g. packing, printing, mailing, *etc.*).
  - viii. Device collection system.
10. Haemoglobin analysis service (full laboratory services).
11. Result reporting service (to screening programme /healthcare providers /cancer registry /*etc.*).
12. Quality monitoring system (EQAS, IQC *etc.*).
13. Supply standard operating procedures (SOP) for use of analytical instrument (to a standard required by accreditation bodies).

14. Product acceptance testing system (prior to distribution of reagents, collection devices or instruction leaflets with new lot changes).
15. Period of contract and service review, and contract break-points.

### **Screening Programme Considerations**

#### *Analytical workload and associated variables*

1. Total test volume:
  - i. Eligible population, age range, likely uptake and frequency of screening.
  - ii. Repeat tests from lab and participant sampling failures, calibration, QC and EQA.
2. Number of analytical sites (need >1 for robust service).
3. Assay frequency (assays / week – affects turn-around time).

#### *Credentials of analytical site*

1. Dedicated accredited laboratory facility.
2. Routine clinical laboratory.
3. Non-laboratory point-of-care test site.
4. Non-laboratory industrial testing site.
5. Storage facility if distributing the collection device (knowledge of capacity and conditions of storage).
6. Fridge / freezer capacity for collection devices stored prior to or following analysis.
7. Fridges for reagents, calibrators and QC materials (separated from returned collection devices).

#### *Transport systems*

1. Mode of distribution of collection devices to subjects /invitees.
2. Mode of return of test kit to analytical facility.
3. Mailing health and safety regulations (biohazard transport requirements).
4. Cost of mailing – may be influenced by H&S regulations.
5. Mechanism to keep samples cold or cool during return to the laboratory (potential requirement for countries with extreme climates).
6. Predicted time period between sample collection and analysis or cold storage prior to analysis.
7. Time vs temperature profile during periods of hot weather.
8. Are samples likely to be frozen during transit in periods of cold weather?

#### *Population served*

1. Age group (upper age boundary might influence device design).
2. Languages required on the packaging or instructions.
3. Accessibility of the programme for individuals with physical or mental disability, blindness or visually impairment and deaf people (helpline access).

#### *Clinical performance (might be influenced by the design and performance of device)*

1. Uptake – averages for total population and male, female, age and ethnic subgroups.
2. Error rate (participant and laboratory).
3. FIT positivity /colonoscopy rate:
  - i. Typical test positivity rate in a screening population at a range of clinically useable cut-off concentrations.
4. PPV, NPV, NNS, sensitivity and specificity for cancer and advanced adenomas at clinically useable cut-off concentrations. (Data should describe the populations in which the studies were conducted adequately and, where available, breakdown of the clinical outcomes data to proximal and distal lesions.)

### **Selection Process**

1. Prepare timescale (Gantt chart).
2. Identify a primary procurement team.
3. Agree the assessment panel.
4. Identify and disclose appropriate expert adviser(s) (consider procurement, finance, clinical, technical, IT, organisational and scientific).
5. Evidence:
  - i. Paperwork (manufacturer, peer review, regulatory).
  - ii. Samples of collection device and any associated literature.
  - iii. System demonstration.
  - iv. Visit to see a functioning site or if not available a visit to see the instrument in operation.
  - v. Independent laboratory assessment.
  - vi. Report of a trial of the analytical system and/or opportunity to conduct a pilot laboratory and clinical assessment.
  - vii. Focus group assessment of sample collection devices and associated materials, including programme literature and instructions for use.

### **Information Requested from the Company**

#### **Product Description and Performance**

##### *Sampling device*

1. Name, description and catalogue number.
2. Description of how the device is used by a participant.
3. Sampled mass of faeces (mg) (mean, SD, n and range with description of how measured – date when last determined).
4. If a buffer is used, its volume (mean, SD, n and range with description of how measured – date when last determined).
5. Unique device ID as machine readable code and eye readable characters (identify requirements of ID, 1D or 2D barcode, system of coding, number of characters, number of unique numbers before repeat, inclusion of expiry date or/and batch number).

##### *Measuring device*

1. Name, catalogue number.
2. Description of the measurement device and how it is used by the lab.
3. Sample loading capability (maximum load).
4. Time from standby to analysis and time to result.
5. Time required and frequency of local maintenance.
6. Analytical rate following calibration, QC measurement and reagent priming.
7. Description of the method of calibration.
8. Level(s) of laboratory expertise required to operate the measurement device /instrument.
9. Size, (footprint included air circulation etc).
10. Services required (water (deionised water), electricity (voltage, current, phases, UPS requirement etc).
11. Instrument interfaces - USB, RS232, Ethernet etc.
12. Combined or separate computer - supplied or not?
13. All software including interface to a laboratory information system, internal QC package - supplied or not?
14. Units reported –  $\mu\text{g}$  Hb/g faeces?

### *System - analytical performance*

Preparations to be used for determination of analytical performance:

- *In vitro* (blood in buffer and/or blood spiked in pooled or individual faecal samples).
  - *In vivo* (non-spiked samples collected from individuals in well-defined populations).
1. Imprecision profile covering the clinically relevant range.
  2. Source and traceability of calibration materials.
  3. Method of assigning the mean and range for controls preparations.
  4. Working measurement range and how determined.
  5. Details of susceptibility of the prozone (hook) effect.
  6. Recommended EQAS supplier.
  7. Specificity – analytical (human Hb variants and animal Hb).
  8. Manufacturing allowable lot-to-lot variation for all relevant reagents combinations.
  9. Stability of Hb in a faecal sample in the collection device related to initial concentration, temperature of storage and period of storage (include details of how stability was determined).

### **Supply arrangements**

1. Frequency of lot changes (breakdown to all reagent and device lot changes).
2. The number and sites of manufacture.
3. Objective evidence on inter-instrument variation – manufacturer’s criteria for acceptable differences.
4. Time from order to supply.
5. Bulk purchase and trickle supply.
6. Business continuity if failure of reagent supply.

### **Support and servicing from company**

1. Number of engineers and geographic location.
2. Response time to call.
3. On-site and on-line support.
4. Development support and training for new staff.
5. User meetings *etc.*

### **Product performance**

1. Company assessment:
  - i. In vitro* (blood in buffer and/or blood spiked in pooled or individual faecal samples).
  - ii. In vivo:*
    - a. Non-spiked samples collected from individuals.
    - b. Measurement in well-defined populations.
2. Independent assessments:
  - i. Both in vitro and in vivo assessments.*

### **Supporting literature**

1. Company literature
  - i. Instructions for use for all elements of the system.*
  - ii. Performance information:*
    - a. Clinical outcomes (refer to ‘clinical performance’ above).
    - b. Analytical performance (refer to ‘system analytical performance’ above).

2. Published literature (papers /reports /evaluation)
  - i.* A list of all of relevant literature that characterises the current product's clinical and technical performance – (exclude literature which is not relevant to current product but include that which is sufficiently similar to be of value but provide details of 'evolutionary' changes.
  - ii.* Copies of the 10 most significant published papers or independent reviews /reports.
3. Independent assessment (analytical and clinical)
  - i.* Both *in vitro* and *in vivo* assessments.