	Bowel Cancer Screening in Guernsey		
Department:	Health and Social Services	**Rank:**	1
Policy Group:	Social Group	**Rank:**	3
Description of proposal	It is proposed to; i. Introduce a bowel cancer screening service in Guernsey using flexible sigmoidoscopy. ii. Invite both men and women of two age cohorts to attend for screening at the Princess Elizabeth Hospital. iii. Detect cancers at an early treatable stage as well as precancerous polyps which will be removed before they develop into cancer. iv. Prevent around 30-40 deaths from bowel cancer in Guernsey over ten years. v. Prevent 60-70 new cases of bowel cancer in Guernsey over ten years. vi. Save money from the costs of treatment avoided on people who otherwise would have developed cancer or may have advanced cancer. vii. Avoid of carers costs.		
Amount requested – 2012	£327,500		
Amount requested - ongoing annually	£327,500		
Duration	Permanent		
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1. Strategic Case

The proposal as detailed below is in accordance with the States objective to 'improve the quality of life of Islanders' and the Social Policy objective to 'Maintain a healthy society …' and is part of HSSD's stated aim to continue to develop a strategy for cancer in order to fulfil its mandate. It is HSSD's top priority for 2012 revenue funding due to the potential benefits to be derived as set out in Section 1.4 of the bid.

1.1. Aims and scope of proposal

i) To introduce bowel cancer screening in Guernsey from January 2012 using flexible sigmoidoscopy.

ii) Invite both men and women of two age cohorts to attend for screening at the Princess Elizabeth Hospital.

iii) Detect cancers at an early treatable stage as well as precancerous polyps which will be removed before they develop into cancer.

iv) Prevent around 30-40 deaths from bowel cancer in Guernsey over ten years.

v) Prevent 60-70 new cases of bowel cancer in Guernsey over ten years.

vi) Save money from the costs of treatment avoided on people who otherwise would have developed cancer or may have advanced cancer.

vii) Avoidance of carers costs.

1.1.1 What makes up the large bowel?

The oesophagus (gullet), stomach, small intestine and large intestine are collectively known as the gastrointestinal tract or the digestive system. The small intestine and large intestine are also known as the small bowel and large bowel respectively. The large bowel is further subdivided into: caecum, ascending colon, transverse colon, descending colon, sigmoid colon and rectum. The rectum is the most distal part of the large bowel (back passage). Although the colon is subdivided into the different names, based on the position in the body, for simplicity, the term large bowel will be used for both the colon and rectum. The transverse colon further divides the large bowel into left and right sides. This document will refer to the left and right large bowel because this is important for screening purposes.

1.1.2 What is bowel cancer?

Bowel cancer also referred to as colorectal carcinoma arises from the lining of the large bowel. Because cancer of the small bowel is rare, bowel cancer in this document and other publications invariably refers to cancer arising from the large bowel.

Bowel cancer arises when the internal structure of a group of cells lining the large bowel is changed by whatever cause. Changes in the internal structure of the cells are influenced by environment (lifestyle) and alteration in the genetic makeup of the cells. When these changes occur, the cells multiply, initially to form a polyp, which is a protrusion or small lump on the lining of the large bowel. These polyps, also known as adenomas and are pre-cancerous. Although not all polyps in the large bowel are pre-cancerous, for simplicity the term polyp in this document will refer to an adenoma.

As the cells in the polyp continue to multiply, they breach the wall of the large bowel and when this occurs, the polyp transforms from being pre-cancerous to cancer. The cancer cells will continue to multiply, invading the surrounding tissue in a disorganised manner, simulating the legs of a crab, hence the name cancer. When cancer cells invade the surrounding tissue there is a risk of invading the lymphatics and blood vessels with subsequent spread to the lymph glands and other internal organs such as the liver.

1.1.3 What is the natural history of bowel cancer?

- **The adenoma-carcinoma sequence**

In a seminal paper published from St Mark's Hospital in London in 1975, the authors mapped out the life history of what they termed the polyp-cancer sequence, now popularly known as the adenoma-carcinoma sequence (*Muto et al, 1975*). This study reported that the development of cancer from a polyp ranged from five to ten years in patients who did not have their polyps removed for various reasons. Further studies established that the prevalence of polyps increases with age (*Arai et al 2000*).

Polyps have different appearances on microscopic examination, which determine the outcome. The probability of progression to invasive cancer can theoretically be estimated on microscopic examination. Those individuals with large polyps, tubulovillous or villous (finger-like appearance) polyps, and multiple occurrences are at greater risk of developing further polyps and cancer.

- **The Dukes staging system**

To determine the outcome (prognosis) of any cancer in patients doctors and nurses apply different staging systems, which is almost a step-by-step assessment of how

badly the cancer will behave. The staging system used for bowel cancer is that devised by Dr Dukes (a pathologist) whilst he was working at St Mark's Hospital in 1932 and it has stood the test of time in predicting the outcome of patients with bowel cancer. The Dukes staging depends on the fact that the bowel is a hollow tubular organ with a 'wall'. When pathologists examine polyps, size is one of the factors assessed to determine the potential of progressing to cancer. However, when cancer develops from a polyp, the cells grow into the bowel wall (invade the wall). It is the depth of the invasion of the wall which the Dukes staging system assesses, thus:

- Dukes Stage A – Cancer involves only part of the bowel wall;
- Dukes Stage B – Cancer involves the full thickness of the bowel wall;
- Dukes Stage C – Cancer involves the bowel wall and also spreads to the lymph glands.

The Dukes staging system has been modified to reflect the spread of cancer to other organs such as the liver. When bowel cancer spreads to other organs this is classified as Dukes stage D. Bowel cancer is not uniformly fatal and Dukes staging is a useful in predicting the five years survival rates in patients with bowel cancer as follows:

- Stage A ~ 90%
- Stage B ~ 50-65%
- Stage C ~ 15-25%

1.1.4 What are the risk factors for bowel cancer?

- **Age**
  Bowel cancer can occur in younger people, but approximately 9 out of 10 people who get it are over the age of 50 years.

- **A previous polyp or bowel cancer**
  Not all types of polyps increase the risk of bowel cancer, but the type called adenomas do.

- **Personal history of chronic bowel inflammation**
  Ulcerative colitis and Crohn's disease will slightly increase the risk of developing bowel cancer.

- **Diet**
  A diet that is high in red meat and fat and low in vegetables, folate and fibre may increase the risk of bowel cancer.

- **Obesity**

  Being overweight or obese may increase the risk of bowel cancer developing.

- **Family history**

  Less than 1 in 10 cancers of the bowel are due to an inherited genetic abnormality. There are certain families who inherit cancer related genes as in familial adenomatous polyposis (FAP) and hereditary non-polyposis colon cancer (HNPCC).

- **Personal history of colorectal cancer**

  Having had bowel cancer before increases the risk of a new cancer developing in future.

1.1.5 How does bowel cancer present?

Changes in health which may indicate underlying bowel cancer include:

- Repeated bleeding from the back passage or blood in the bowel motion;
- Persistent change in bowel habit to looser bowel motions and/or needing to go to the toilet more than usual, alternating with constipation;
- Abdominal pain or discomfort;
- Unexplained tiredness or weight loss;
- Anaemia from cancers which bleed slowly, but the blood is apparent to the naked eye.

These changes do not definitely indicate the presence of bowel cancer but they should be taken seriously and investigated by the doctor.

1.1.6 What is the incidence of bowel cancer in Guernsey?

An average of 35 new patients are diagnosed with bowel cancer every year in Guernsey. This gives an incidence of 58/100,000. In 2007 the UK recorded 38,608 new cancers with an incidence of 46/100,000 per year (*Cancer Research UK 2007*). These figures indicate that Guernsey has more patients with bowel cancer than the UK. Similar to the UK bowel, cancer affects more men than women with a ratio of 2:1. The median age for bowel cancer in Guernsey is 71 years (*Clinical Cancer Services Report 2008*).

1.1.7 What is the stage of bowel cancer at presentation in Guernsey?

Table 1 illustrates results from a 10 year study (1992 – 2001) by the Bowel Cancer Multidisciplinary Team in 2002 which presented at the Pathological Society of Great Britain and Ireland (*Chinyama et al 2002*). This study showed that nearly 35% of patients present late as Dukes stage C or worse when the cancer had already spread to the lymph glands and other organs. Another 35% of patients with Dukes stage B cancer which would have spread through the bowel wall but not to the lymph glands. Only 12% presented with early Dukes stage A cancer. Between 2003 and 2007, 26 to 47 cases were recorded each year.

Stage	Guernsey Patients	UK Patients*
Dukes A	12% (39)	15%
Dukes B	35% (117)	40%
Dukes C	32% (108)	45%
Dukes D	2% (7)	-----
Stage N/A	19% (62)	-----
Total	100 (333)	100

Table 1. Dukes staging of bowel cancer patients in Guernsey compared with UK patients (*Misiewicz et al 1994): Although there are no significant differences between the stages of Guernsey and UK patients, it is important to detect cancer at potentially curable stages A or B, before the cancer has spread to the lymph glands. Screening should improve patient outcome by detecting cancers at an early stage.

1.1.8 Screening Flexible sigmoidoscopy

Recent pilot studies indicate that flexible sigmoidoscopy is superior to FOBT in detecting cancers and pre-cancerous polyps. Guernsey will use flexible sigmoidoscopy as the method of choice for bowel cancer screening instead of FOBT. Flexible sigmoidoscopy is a test which allows the doctor or nurse to examine the lining of the left side of the large bowel using a flexible tube or telescope with a light at the end.

1.1.8.1 The evidence for using flexible sigmoidoscopy for screening includes:

a) Over two thirds of the cancers arise in the left side of the large bowel;

b) Flexible sigmoidoscopy will detect pre-cancerous polyps which will be removed before they develop into cancer and thereby acting as a preventative measure;

c) Detection of high-risk polyps, i.e. polyps ≥ 1cm, polyps with advanced precancerous changes (high-grade dysplasia), polyps with finger-like appearance (villous) and multiple polyps (two or more polyps) in left side of the bowel are associated with increased risk of advanced polyps or cancers in the right side of the bowel (*Imperiale et al 2000*); *Rubio et al 2002*);

d) Detection of high risk polyps at flexible sigmoidoscopy in the left side of the bowel will initiate referral for colonoscopy, which may detect cancer or further polyps in the right side of the bowel.

1.1.8.2 The advantages of using flexible sigmoidoscopy for screening are:

a) Flexible sigmoidoscopy is more acceptable to the public than FOBT as the process is carried out by the doctor or nurse rather than the individual being screened;

b) No need for full bowel preparation;

c) Lower cost;

d) No need for sedation;

e) Reduced complications.

1.2. Strategic Fit

1.2.1 Purpose of screening programmes?

Screening looks for evidence of a disease in people who have no symptoms. The aim is to find disease at an early stage when there is a better chance of a person being successfully treated. Screening is not a diagnostic test. Finding an abnormal result in screening may show that a person is at risk of a disease. Further tests will be needed to make an accurate diagnosis.

1.2.3 Why screen for bowel cancer?

Bowel cancer is an important public health problem in Guernsey. There are more patients with bowel cancer in Guernsey per population of 100,000 than in the UK. Based on the Guernsey Multidisciplinary teams' data collection for the past five years, bowel cancer is the second most common cancer in Guernsey after breast cancer (*Clinical Cancer Services Annual Report 2009* - see para 1.2.7). Published evidence has shown that screening for bowel cancer can help reduce death rates by finding and treating bowel cancer at an early stage. It is predicted that deaths from bowel cancer could drop by 15 - 40% as a result of screening, depending on the method of screening. Patients whose cancer is discovered early have more treatment options and a better long-term outlook than when the cancer is discovered at a late stage.

1.2.4 Faecal occult blood test (FOBT) pilot studies

Pilot studies carried out in Nottingham, Coventry, Scotland and Canada reported that bowel cancer screening using faecal occult blood test (FOBT) reduced mortality by 16-23% (*Kronborg et al 1996; Hardcastle et al 1996*). It was on this evidence that the UK introduced bowel cancer screening in 2006 using FOBT in men and women aged between 60-69 years. Due to lack of staff with colonoscopic skills, the HSSD was unable to introduce bowel cancer screening at an earlier stage although funding was originally made available in 2007.

1.2.5 Flexible sigmoidoscopy pilot studies

In addition to FOBT, studies have also shown that examining just the left side of the large bowel using a sigmoidoscope (a flexible tube with light and telescope at the end) also reduces the risk of dying from bowel cancer in the screened population by 40%. The rationale for sigmoidoscopy is that over two thirds of large bowel cancers arise from the left side. The majority of the cancers arise from pre-cancerous polyps. These polyps when in their early stage of development do not bleed and may not be detected by FOBT. It is on the basis of this evidence that a large multicentre pilot study funded by several cancer charities including Cancer Research UK was implemented in the UK under the leadership of Professor Wendy Atkin who is based at St Mark's Hospital, London (*Atkin et al 2010*). The study invited men and women aged 55 to 64 years to participate in a flexible sigmoidoscopy pilot study. The results were published in the Lancet in May 2010 and reported that flexible sigmoidoscopy was superior to FOBT in detecting cancer and pre-cancerous polyps, and thus reducing deaths from bowel cancer. The results indicated about one cancer prevented for every 200 people screened and one death prevented for every 500 people screened.

1.2.6 Does bowel cancer meet the Wilson & Jungner criteria for screening?

In 1968 Dr Wilson (Principal Medical Officer, Ministry of Health, England) and Dr Jungner (Chief Clinician, Chemistry Department, Sweden), on behalf of the World Health Organisation (WHO) published criteria to be used to evaluate whether a disease (cancer and non-cancer) requires screening under four main headings: the condition, the test, the treatment and screening programme (*Wilson and Jungner 1968*).

These criteria were applied to bowel cancer below to determine the suitability for implementing a screening programme in Guernsey.

1.2.7 The condition

i) The condition should be an important health problem.

With an average of 35 new cancers per year, bowel cancer is the second most common cancer in Guernsey after breast cancer (48) followed by lung cancer (32) and prostate cancer (30) (*Clinical Cancer Services Report 2009, MOH Annual Reports*). Guernsey has a higher incidence of bowel cancer of 66 per 100,000 people when compared to the UK with 46 new bowel cancer patients per 100,000 people (info.cancerresearchuk.org). In addition, over a third of the patients present with advanced disease with only 15-25% chance of five-year survival (*Chinyama et al 2002*).

ii) The epidemiology and natural history of the condition, including development from latent to declared disease, should be understood adequately and there should be a detectable risk factor, disease marker, latent period or early symptomatic stage.

There is arguably a better understanding of the development of bowel cancer than other cancers based on the study of the adenoma-carcinoma sequence (polyp-cancer sequence - *Muto et al 1975*). Most bowel cancers arise from pre-existing precancerous polyps termed adenomas. Removal of these adenomas reduces the risk of cancer. The most recent study using flexible sigmoidoscopy (*Atkin et al 2010*) reported that the incidence of bowel cancer was reduced by a third in people who underwent screening with removal of polyps. If the results were confined to the left side of the bowel the incidence of bowel cancer was reduced by 50%. This is based on the evidence that flexible sigmoidoscopy detects pre-cancerous polyps which are removed before they develop into cancer. If the polyps subsequently develop into cancer, patients can present with bleeding from the back passage, change in bowel habit where symptoms of diarrhoea alternate with constipation, and in advanced stages, loss of weight.

iii) All the cost-effective primary prevention interventions should have been implemented as far as practicable.

There are health promotion programmes on bowel cancer awareness by the HSSD and charitable organisations, but a significant number of patients in Guernsey still present late.

1.2.8 The test

i) There should be a simple, safe, precise and validated screening test

Faecal occult blood test and flexible sigmoidoscopy have been validated as safe screening methods. Guernsey proposes to use flexible sigmoidoscopy as the method of choice.

ii) The distribution of test values in the target population should be known and a suitable cut-off level defined and agreed

The selected age group is 55 – 65years because an average age for detection of polyps is 60years old and the median age for cancer in Guernsey is 71years. Screening this age group will also detect polyps and potentially curable early cancers. Two age cohorts will be selected in this age group.

iii) The test should be acceptable to the population

Pilot studies indicate that faecal occult blood test and flexible sigmoidoscopy are acceptable tests with a preference for flexible sigmoidoscopy. The studies have also reported a higher uptake for screening with flexible sigmoidocopy than with faecal occult blood test because the test is carried out by a doctor or nurse and not by the individual.

iv) There should be an agreed policy on the further diagnostic investigation of individuals with a positive test result and on the choices available to those individuals

Colonoscopy will be the main modality of further investigation following abnormal results at flexible sigmoidocopy. Virtual colonoscopy (CT clonography) and barium enema are available for individuals whom, for whatever reason, cannot tolerate colonoscopy. CT Scan and MRI are available locally for further investigation of those patients diagnosed with bowel cancer.

1.2.9 The treatment

i) There should be an effective treatment or intervention for patients identified through early detection, with evidence of early treatment leading to better outcomes than late treatment

There is evidence that early detection of cancer improves survival. Local surgical skills for bowel cancer are excellent and better than most general hospitals. This was confirmed when Princess Elizabeth Hospital participated in the CLASICC trial – a Medical Research Council randomised trial of laparoscopic surgery versus conventional open surgery in patients with colorectal cancer and the results were published in the Lancet in 2005 (*Guillou et al 2005*). This study paved way for general use of laparoscopic surgery (keyhole surgery) in the treatment of bowel cancer nationwide. Laparoscopic surgery makes surgery for bowel cancer in older patients safer. Recently the Medical Specialist Group employed a second surgeon with colonoscopic skills which will further improve the service.

ii) There should be agreed evidence-based policies covering which individuals should be offered treatment and the appropriate treatment to be offered.

Patients will be discussed at multidisciplinary meetings, which are well established for symptomatic cancers. Treatment choice will be determined on individual basis, depending on site of the cancer, stage at presentation and other underlying illnesses. Management of patients with bowel cancer locally is based on the NICE guidelines – *'Improving outcomes of colorectal cancers 2004'*

iii) Clinical management of the condition and patient outcomes should be optimised by all health care providers prior to participation in a screening programme.

This will be a multidisciplinary process involving nurses, doctors and other allied health professionals.

1.2.10 The screening programme

i) There should be evidence from high quality randomised controlled trials that the screening programme is effective in reducing mortality or morbidity.

Randomised controlled studies in the UK, Canada and USA have shown the benefit of screening for bowel cancer in reducing mortality (*Hardcastle et al 1996; Kronborg et al 1996; Atkin at al 2010)*

ii) *There should be evidence that the complete screening programme (test, diagnostic procedures, treatment/intervention) is clinically, socially and ethically acceptable to the public and health professionals.*

Evidence from studies (above) is supportive of this statement.

iii) *The benefit from the screening programme should outweigh the physical and psychological harm (caused by the test, diagnostic procedures and treatment).*

Evidence from pilot studies is supportive of this statement. Although colonoscopy is more accurate than faecal occult blood test and flexible sigmoidoscopy, colonoscopy is not safe as a primary screening tool and therefore is not used for this purpose.

iv) *The cost of the screening programme (including testing, diagnosis and treatment) should be economically balanced in relation to expenditure on medical care as a whole.*

The decision to make a large investment in health as a preventive measure is based on a balance of many considerations including scientific evidence, public pressure and political will. Screening for bowel cancer to be cost-effective from a variety of studies. However, rational decisions to spend money on screening cannot simply be based on costs or any other single dimension. If a decision is not to fund the screening initiative the following subjective judgements may be taken into account (a) the disease is not an important enough public health problem or (b) that the reduction in incidence or mortality is not enough to justify the expense or (c) that the cost is too high.

v) *There should be a plan for managing and monitoring the screening programme and an agreed set of quality assurance standards.*

If funded, the screening programme will be subject to British Society of Gastroenterology and Endoscopy Global Rating Scale guidelines in order to maintain quality of flexible sigmoidoscopy and colonoscopy procrdures.

vi) *Adequate staffing and facilities for testing, diagnosis, treatment and programme management should be available prior to the commencement of the screening programme.*

This is the subject of this document to seek funding to implement an adequately staffed and funded programme.

vii) *All other options for managing the condition should have been considered (e.g. improving treatment, providing other services).*

There are excellent endoscopic, pathological, radiological, surgical and medical oncology skills on the island to care for bowel cancer patients in a multidisciplinary environment. Radiotherapy service is offered in Southampton and the facilities appear to be satisfactory.

1.2.11 What method will be used for bowel cancer screening in Guernsey?

In 2006 FOBT was introduced as the method of bowel cancer screening in England, Wales and Scotland. In October 2010, the British Government allocated £60million to introduce flexible sigmoidoscopy as second method for bowel cancer screening. This was based on the results of multicentre pilot study, which showed that flexible sigmoidoscopy was superior to FOBT in detecting bowel cancer and pre-cancerous polyps (*Atkin et al 2010).* The UK will run the two methods of screening concurrently, i.e. flexible sigmoidoscopy for the 55 – 59 year age group and FOBT for the 60 – 74 year age group. As Guernsey has not introduced bowel cancer screening using the FOBT as per the original Business Case (2005), it is now proposed to introduce the more effective flexible sigmoidoscopy as the method for bowel cancer screening in Guernsey for the following reasons:

i) Running a two-tier system, i.e. FOBT and flexible sigmoidoscopy will be very complicated for all involved because unlike the NHS, there are three different health care systems in Guernsey, namely: Independent Primary Care, Medical Specialist Group and the Health and Social Services Department.

ii) Studies have shown that flexible sigmoidoscopy is more cost-effective as a method for bowel cancer screening than FOBT (*Whynes et al 2003; O'Leary et al 2008*). Running the two programmes together will be more costly than using flexible sigmoidoscopy alone with resultant poor clinical yield from FOBT.

iii) More importantly a published multicentre study reported that flexible sigmoidoscopy reduced death from bowel cancer in those individuals who had undergone screening by 40% compared to 20% when FOBT is the method of choice (*Atkin et al 2010).* The level of uptake for FOBT was 57% compared to 71% with flexible sigmoidoscopy. Flexible sigmoidoscopy detects 5% abnormalities which require referral for colonoscopy compared to 2% when using FOBT (Table 2).

Test	Uptake	Referral for colonoscopy	Mortality reduction	Preventative effect	Frequency	Cost
FOBT	54%	2%	15 – 20%	Detects mostly cancer	2 – yearly	Costly for low yield
Flexible sigmoidoscopy	71%	5%	40%	Detects polyps &	5 – yearly	Cost effective

				cancer		

1.2.12 Who will be invited for bowel cancer screening?

It is always a difficult decision when introducing a screening programme as to which group of the population to include and exclude in the programme. This is more so with bowel cancer because the condition affects both men and women, beginning around 50 years of age and the frequency increases with age. On the face of it, it would be appropriate to introduce an island-wide screening programme. The benefits of introducing such a programme need to be weighed against the risk of not doing so. Firstly, although it is not possible to put monetary value on the lives which will be saved by introducing an island-wide screening programme, embarking on such large project would require huge investment to the detriment of other health services. The selection of the people who will attend the screening programme will therefore be partly based on scientific evidence and on partly taking a pragmatic approach to maximise the benefits of the screening programme.

Currently the Scottish bowel cancer screening programme invites men and women between the ages of 50–74 for screening every two years using the FOBT. Similar to Guernsey the median age of bowel cancer in Scotland is 71 years. The English and Welsh FOBT screening programmes invite men and women between the ages of 60–69 years, which will be extended to 74 years.

With the introduction of the flexible sigmoidoscopy in England, the bowel cancer screening will have a two-tier programme. Flexible sigmoidoscopy programme will be offered as a one off examination to men and women between 55 – 59 years old and faecal occult blood testing will continue every two years in the 60 – 74 year age group.

In Guernsey it is proposed to use only flexible sigmoidoscopy for two age cohorts for screen men and women in the 55 - 65 year age group based on the following evidence:

i) Bowel cancer below the age of 50 years is rare;

ii) It takes approximately 10 years for a pre-cancerous polyp to grow and develop into cancer (*Muto et al 1977*);

iii) The median age group for bowel cancer in Guernsey is 71 years;

iv) The mean age of detecting polyps in the UK Multicentre Flexible Sigmoidoscopy Trial was 60 years (*Atkin et al 2010*). Over thirty years ago a separate study reported that the mean age for detection of precancerous polyps was 60 years (*Spujt & Estrada, 1977*).

v) Expert advice from external sources;

1.2.12 How many people will be screened per year?

The number of people to be invited will depend on:

i) The endoscopic facilities available as to how many participants can be accommodated;
ii) The number of endoscopy sessions available;
iii) Adequate nursing staff in the endoscopy unit;
iv) Adequate endoscopes.

Based on the 2001 census there are 11,276 men and women in the 55 – 74 year age group. This is a large number of people to screen which will require massive investment into the programme and is not practically feasible with the current resources in the Day Patient Unit.

The initial screening round aims to screen 1,120 patients screened per annum (two cohorts of 800 with assumed take up rate of 70%). This will achieve initially 10 patients screened per session with the initial two cohorts effectively screened over a 15 month period. Future years will require 12 patients per session to be screened to hit targets, working on two sessions a week over 48 weeks of the year (96 sessions). Based on the local Breast Screening Programme, it is estimated that there will be a high uptake. The exact age cohort to be screened are to be decided.

As the programme is established the screening will be rolled out to other age groups depending on the resources available. Rolling out is an established way of handling large population screening programmes. The UK rolled out bowel cancer screening when this was introduced in 2006.

Continuous bowel cancer awareness should encourage those people not included in the cohorts or those awaiting screening to look out for signs and symptoms of bowel cancer and to visit the GP if worried. The GPs will be encouraged to use FOBT as an initial test to prevent overloading the endoscopy service. FOBT has always been used by doctors as (a diagnostic test) well before introduction of formal bowel cancer

screening programmes. The programme will exclude patients who have had colonoscopy in the past year for whatever reason and those on follow up of high risk polyps detected during the screening programme. This will reduce the number of people invited for screening flexible sigmoidoscopy. Names of prospective participants will be provided by the GPs similar to the Breast Screening programme.

1.2.13 Who will perform flexible sigmoidoscopy?

There are three possible options:

i) Qualified Nurse Endoscopist

Although the original business case identified a nurse endoscopist as the primary screener there are several constraints if the screening is to commence on 1st October 2011:

- The project is going to commence as a pilot study and it is not possible to recruit a nurse endoscopist for a pilot study from the UK.
- The nurse has to be supported by a consultant whilst screening and this requires separate screening accommodation away from the routine suite where the consultant will also be working.
- It is essential to have a consultant around in the event of complication such as bowel perforation
- There is also high probability that it will not be possible to recruit a nurse endoscopist from the UK.

ii) MSG Consultants

- The MSG has three consultants who are capable of carrying out flexible sigmoidoscopies.
- Employing the MSG will obviate the above nurse endoscopist-related constraints.
- Employing local consultants will improve continuity of care

iii) Training a Local Nurse Endoscopist

- Training a local nurse endoscopist to work in tandem with the Consultant after three years will increase the number of patients screened. This will also give the HSSD time to improve the endoscopy accommodation.

- Use of nurse endoscopists is now acceptable in most endoscopy units (*Maule 1994*) and is endorsed by the British Society of Gastroenterology (*Non-Medical Endoscopist 2005*). The current Endoscopy Unit nursing staff will support the screening process.

v) Preferred Option

- It will be pragmatic to employ the MSG at the right price to perform the flexible sigmoidoscopies for the pilot study and live programme for the first three years. The screening will then be performed by the MSG Consultant and a nurse endoscopist to increase the number of patients screened. If a suitable contract cannot be negotiated with MSG the contingency would be to recruit overseas endoscopists

- Screening is not covered by the current MSG contract with the States, but the products of the screening programme such as colonoscopy and the surgery thereafter are part of the contract similar to cervical and breast cancer screening.

- The HSSD will administer the programme.

1.2.14 What will happen after flexible sigmoidoscopy (see appendix 1)**?**

Patients with multiple polyps, advanced pre-cancerous changes in polyps (high grade dysplasia) and polyps over 1cm will be referred for colonoscopy which will examine the entire large bowel including the right side. Colonoscopy is an extension of flexible sigmoidoscopy. The colonoscope is much longer than a sigmoidoscope and enables the nurse or doctor to completely visualise the large bowel lining to identify pre-cancerous polyps and cancer.

Because colonoscopy examines the whole of the large bowel lining, it is more accurate than flexible sigmoidoscopy. One would therefore argue that it would make sense to use colonoscopy as a screening tool. However, colonoscopy is a complex procedure which requires a highly skilled doctor or nurse endoscopist. Colonoscopy requires sedation and there are associated complications. Because screening programmes invite "well" people to undergo a screening process, and in the majority of cases there

is nothing to find, it would be inappropriate to use colonoscopy for screening which could potentially be harmful to individuals with no symptoms of cancer. For this reason, in the UK, colonoscopy is not used as a first line test for bowel cancer screening. However, colonoscopy is an important procedure to examine patients with positive FOBT or those with high risk polyps found at flexible sigmoidoscopy as previously alluded to.

Patients with other abnormalities such as inflammation will be referred to the Gastroenterologist for further assessment. Those individuals with negative flexible sigmoidoscopy or polyps less than 1cm will be discharged. Throughout this process, the patient will be supported by a bowel cancer screening nurse.

1.2.15 Impact of bowel cancer screening on other services

i) Impact on endoscopy service

There is a need for adequate accommodation to absorb the extra volume of patients attending the unit. The accommodation should allow privacy and maintenance of confidentiality. It is essential to have adequate endoscopes (sigmoidoscopes and colonoscopes) for screening purposes to minimise interference with investigation of patients who present symptomatically with other conditions. Adequate equipment sterilising facilities are also essential with an increased volume of patients.

ii) Impact on surgery

Assuming 70% uptake, if 1120 people are screened, it is estimated that the screening programme will detect around 9-10 new cancer patients per year and some larger polyps which cannot be removed endoscopically.

iii) Impact on radiology

The extra new cancers detected in the screening programme will require CT scan and MRI for staging depending on the site of the cancer. There will be a small number of patients who will fail to complete colonoscopic examination and will require either double contrast barium enema or CT colonography (virtual colonoscopy).

iv) Impact on pathology

Significant extra workload will be generated from removal of pre-cancerous polyps as well as extra new cancers. This will require extra Biomedical Scientist and Consultant staff time.

v) Impact on oncology

Bowel cancer screening will detect both early and advanced cancers in people unaware that they harboured cancer. Patients with advanced cancers, Dukes Stage C or above, will require chemotherapy. However, the main advantage of flexible sigmoidoscopy screening programme is the detection of polyps before they become cancerous and thus save money on chemotherapy in the long term.

vi) Clinical leadership

Time will be required for the Clinical Director of the service to oversee the operation of the service, quality control, production of clinical governance reports and ensuring a high quality service is established and maintained.

1.2.15 Education and training

For any health care programme to be effective it should be backed up by appropriate training and education. Before the introduction of the programme, the HSSD will hold a public bowel cancer awareness day. This will inform the public what bowel cancer is, the importance of screening, what method of screening will be used, who will be screened and what will happen after screening. The public will also be informed of the signs and symptoms of bowel cancer and not to wait to be called for screening should they experience these worrying symptoms.

The public will be provided with leaflets on bowel cancer, leaflets and consent forms on flexible sigmoidoscopy and for those requiring colonoscopy similar paperwork. These documents are freely available on the NHS Bowel Cancer Screening website and the British Society of Gastroenterology website.

As all patient care is now based on a multidisciplinary approach, GPs, community nurses, hospital nurses and hospital doctors and other allied health professionals will be invariably asked about bowel cancer and bowel cancer screening. Dissemination of information through meetings of the core workers of the programme with GPs is

essential. Island-wide dissemination of information via leaflets at GP practices will be another way of getting information to the public.

1.2.16 Quality assurance

The endoscopy service will be run according to the British Society of Gastroenterology (BSG) guidelines and global rating system (GRS). The pathologist already participates in the BSG external quality assurance on reporting of polyps. The local infection control team and endoscopy staff will ensure adherence to high standards of hygiene to reduce the risk of infection.

1.3. Critical Success Factors

This proposal will be dependent upon the following essential areas of activity being performed well to ensure success:

Critical Success Factor	Proposal outcome it relates to
1. The proportion of people offered screening who take up the offer is at least 60%.	The higher the proportion of people who take up screening the better the population outcomes in terms of deaths from bowel cancer and bowel cancer cases avoided.
2. The PEH can accommodate and deliver screenings to the required quality.	Outcomes are dependent on a quality screening service
3. Reduction in treatment costs in future years.	While no target has been set for cost reductions, the more people screened, the greater the future savings from treatment avoided.

1.4 Impact of not proceeding

- Thirty to forty more bowel cancer deaths in Guernsey over ten years.
- Sixty to seventy more new cases of bowel cancer in Guernsey over ten years.
- More money spent on treating people with bowel cancer.
- In addition to using up States resources, hospitalised patients are not economically productive. Bowel cancer affects mature men women who are at the height of their career and most economically productive.

- Cost of carers time.
- More upset from relatives and friends of bowel cancer sufferers.

1.4 Benefits

- Detection of cancers at an early treatable stage as well as precancerous polyps which will be removed before they develop into cancer.
- Prevention around 30-40 deaths from bowel cancer in Guernsey over ten years.
- Prevention 60-70 new cases of bowel cancer in Guernsey over ten years.
- Save money in the future from the costs of treatment avoided on people who otherwise would have developed cancer or may have advanced cancer. The treatment would include hospital admission, surgery, chemotherapy and radiotherapy.
- Avoidance of carers costs.
- A healthy population is economically viable to the States.

2 Outline Economic Case

2.1 Unlike the USA where bowel cancer screening is carried out on a private basis, paid for by the insurance companies, there is very little information on the economic benefits on bowel cancer screening using flexible sigmoidoscopy in the British literature. From an Island point of view bowel cancer affects people over the age of 50 when they are at the peak of their careers and thus economically at their most productive. Therefore any time spend in hospital for treatment for bowel cancer is not only depleting the States of resources from the treatment, but also economic resources as the individual is not economically viable as they will be off work. Publications in the USA analysed the cost-effectiveness of bowel cancer screening using different methods but this case will concentrate on flexible sigmoidoscopy which is the method of choice for the HSSD. The figures differ depending on the publication because of the different insurance premiums.

2.2 In addition to determining the effectiveness of bowel cancer screening, it is important to assess the economic impact of not introducing bowel cancer screening, i.e., the cost of treatment of bowel cancer. In 2006 the York Health Economics Consortium in conjunction with Sheffield University produced a report for the Department of Health for England and Wales entitled "Bowel Cancer Services: Costs and Benefits". The project analysed the cost of:

i) Diagnosis: clinical assessment, endoscopy, radiology and pathology;
ii) Primary treatment: surgery, chemotherapy and radiotherapy;
iii) Follow-up (surveillance): clinical assessment, endoscopy, radiology and pathology;
iv) Recurrence: chemotherapy and surgery;
v) Stoma care;
vi) Palliative care: interventions and end of life care;
vii) Diagnostic tests in non-cancer patients, i.e., those patients referred with suspected cancer, but turn up to be negative;
viii) Screening for bowel cancer.

2.3 For a large country like the UK the cost of treatment of bowel cancer was £1.4 billion with 26.44% of the budget being spent on diagnosis. However, the average cost of treatment for bowel cancer was £8,808 - £12,037 per episode. If this information is extrapolated from the USA figures, the cost of treatment of bowel cancer (excluding diagnostic tests, follow-up and palliative care) is similar to the cost-effectiveness of bowel cancer screening per life saved. Economically the figures are in favour of introducing bowel cancer screening than the status quo because by detecting polyps at an early stage will do away with the cost of investigating and treating the cancer.

2.4 By taking a very conservative approach, if 20 out of 1000 patients are diagnosed with precancerous polyps a year which are removed before they progress into cancer that would save £200,000 in the future in the treatment alone excluding the diagnostic tests or palliative cost had the patients developed cancer. Therefore the option of leaving the status quo is not economically viable.

2.5 Bowel cancer screening will also detect cancers at an early stage. These patients will still undergo the various diagnostic tests which will still be expensive. However, if the cancer is in its early stage, the patients will only be treated by surgery and not require chemotherapy or radiotherapy.

2.6 Screening does not eliminate patients who present late with bowel cancer. There will still be patients who will present with advanced cancer which will require treatment with chemotherapy and radiotherapy.

2.7 In the first few years of a screening programme, costs of treatment are likely to increase as there will be increased detection. Treatment cost savings are likely to be seen once the programme has been established for five to ten years.

3.0 Outline Commercial Case

The PEH will be used to undertake screening. This is the only facility in Guernsey set up to complete this.

Consultants at the MSG are the only on island competent provider to deliver sigmoidoscopy and we are currently in negotiations with MSG to deliver the service. The cost obtained from the MSG will be benchmarked against those available from UK providers to ensure value for money is achieved prior to any contract award. If however the value of money test is not passed, then UK based providers capable of delivering an on island service will be sort.

4.0 Outline Financial Case

The HSSD has committed to fund up to £50,000 for an initial three month pilot study to commence from 1st October 2011. This funding commitment is a one off for 2011 only and further funding from the States is required to roll out full implementation of the screening programme from the 1st January 2012.

4.1 Summary of Financial Requirements for the Programme (for screening two cohorts)

In summary the proposal is for revenue funding requirement of £328,000 per annum ongoing to fund a screening programme covering an anticipated 1,120 individuals annually based around 2 age cohorts. The programme cost per patient of providing screening service equates to £284 which compares to the NHS national tariff of £398 for a diagnostic sigmoidoscopy.

In addition there will be some capital investment required in equipment to support the introduction of the service totalling £167,000 over the course of the five year cycle.

States Strategic Plan Project — Colorectoral Cancer Screening

Based on cohort of 1600
based on 70% take up or 1120 patients screened per annum

	Years					
	2012	2013	2014	2015	2016	Total
Treatment Costs - Do Nothing (scenario)	270,781	270,781	270,781	270,781	270,781	1,353,905
Treatment Costs Screening scenario						
30% unscreened	81,261	81,261	81,261	81,261	81,261	406,305
70% screened	179,986	179,986	175,487	148,489	125,990	809,938
Total	261,247	261,247	256,748	229,750	207,251	1,216,243
Cancers treated						
Ongoing treatment Costs Screening Programme v Do Nothing[6]	(9,534)	(9,534)	(14,033)	(41,031)	(63,530)	(137,662)
Screening costs						
Procedure costs[1]	270,000	270,000	270,000	270,000	270,000	1,350,000
Administration Support	22,500	22,500	22,500	22,500	22,500	112,500
HSSD Training/Travel/CPD	6,000	6,000	6,000	6,000	6,000	30,000
Quality Assurance	15,000	15,000	15,000	15,000	15,000	75,000
QA's GP's Submission	1,000	1,000	1,000	1,000	1,000	5,000
Maintenance Costs	1,000	1,000	1,000	1,000	1,000	5,000
Software Licenses	2,000	2,000	2,000	2,000	2,000	10,000
Stationary & Marketing	10,000	10,000	10,000	10,000	10,000	50,000
Administration Costs	57,500	57,500	57,500	57,500	57,500	287,500
Programme Costs	327,500	327,500	327,500	327,500	327,500	1,637,500
Reduction in ongoing treatment	(9,534)	(9,534)	(14,033)	(41,031)	(63,530)	(137,662)
Net Revenue Cost / (Benefit)	317,966	317,966	313,467	286,469	263,970	1,499,838
Capital requirements[3]						
Sigmoidoscope[2]	27,000					27,000
Stack system[5]		100,000				100,000
IT System[4]	30,000					30,000
Room Refurbishment / PC's	10,000					10,000
Net Capital Investment	67,000	100,000	-	-	-	167,000
Total Funding Impact	384,966	417,966	313,467	286,469	263,970	1,666,838
Revenue cost per patient screened	283.90	283.90	279.88	255.78	235.69	133.91
Capital cost per patient screened	59.82	89.29	0.00	0.00	0.00	14.91
Total cost per patient screened	343.72	373.18	279.88	255.78	235.69	148.82

Note:

1. Procedure Services — this includes DPU staff, Screening Services, Pathology Services, Bio Chemistry and other direct procedure overheads
2. Sigmoidoscope — The initial purchase will be undertaken by the HSSD from it capital allocation. Support for this purchase, from a local charity may be forthcoming.
3. Capital — service, however, the funding will be supported from within the HSSD capital allocation
4. IT System — An Endoscopy IT system is required and this will link to the HSSD EHSCR system.
5. Stack System — This supports endoscopy running in a second theatre setting to enable throughput of screening volumes.
6. Savings — Screening is a long term initiative which in the early years will increase detection and treatment but that once this worked through will be longer term savings which are outside the scope of the 5 year horizon.

5 Outline Project Management Case *(See appendix 2)*

5.1 The Bowel Cancer Screening Programme

The Project management and risk arrangements and indicative project plan are shown below.

4.2 Project Management arrangements

- Senior Responsible Officer – Director of Public, HSSD
- Project Manager – Consultant Pathologist/Lead Cancer Clinician, HSSD
- Project Co-ordinator – Lead Cancer Nurse
- Project Board – identified — Meeting monthly
- Project Team identified — Meeting weekly
- Stakeholders identified
- Senior Responsible Officer reports weekly to HSSD Corporate Management Team.
- HSSD Corporate Management Team reports to the HSSD Board,

4.3 Risk Assessment

The major risks to successful implementation of the proposal have been assessed as follows:

Risk Description	Impact 1 (very low) to 5 (very high)	Likelihood 1 (very low) to 5 (very high)	Responsibility of	Mitigating Action
1. Endoscopy facilities	5/5	2/5	Director of Corporate Services/Day Case Unit	
2. Procurement of endoscopists	5/5	2/5	Director of Finance/MSG Lead Cancer Nurse	
3. Administration support	5/5	2/5	GPs	
4. GP lists	4/5	2/5	EHSCR and lead clinician	
5. IT support	3/5	3/5	Health Promotion Unit	
6. Marketing programme	3/5	2/5	Pathology Unit	
7. Pathology	5/5	2/5		

4.4 Issues and dependencies

- Negotiation underway with the MSG to include screening in their contract.

4.5 Indicative project plan

• Procure specialist endoscopy services	June 2011
• Ensuring adequate endoscopy suite facilities	June 2011
• Identify IT requirements	June 2011
• Decide target population	June 2011
• Internal quality assurance baseline	June 2011
• Obtain GP list	July 2011
• Production of patient information	July 2011
• Finalise patient pathway protocols	July 2011
• Promoting Public awareness	September 2011
• Invite patients for screening	September 2011
• Pilot study to commence	October 2011
• Main service proposed to commence	January 2012
• Evaluation	To be arranged
• External quality assurance	To be arranged

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19. http://info.cancerresearchuk.org/cancerstats/types/bowel

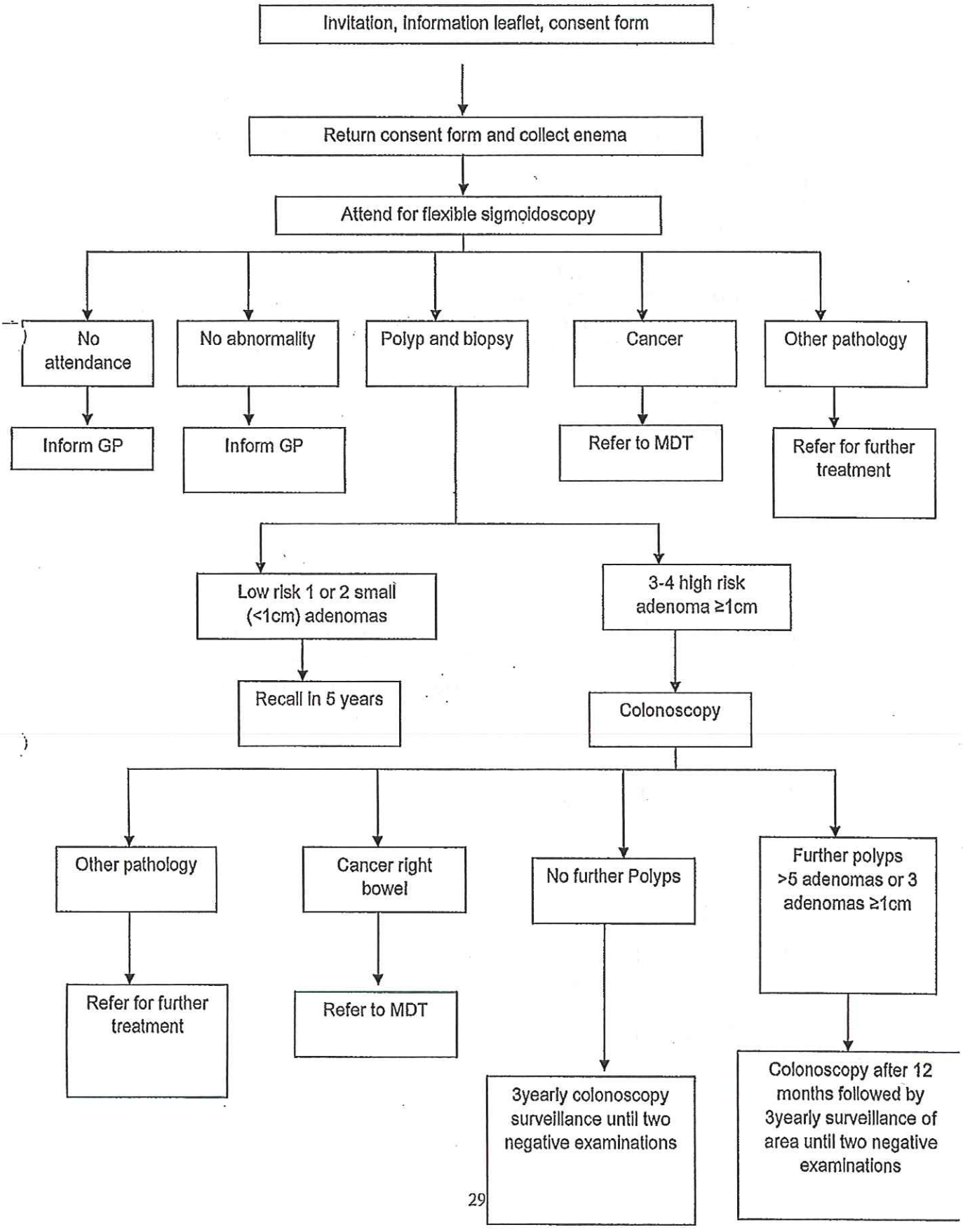
20. www.nsd.scat.nhs.uk/services/screening/bowelscreening

21. Http://www.NSC.nhs.uk/pdfs/proposal colorectal.pdf

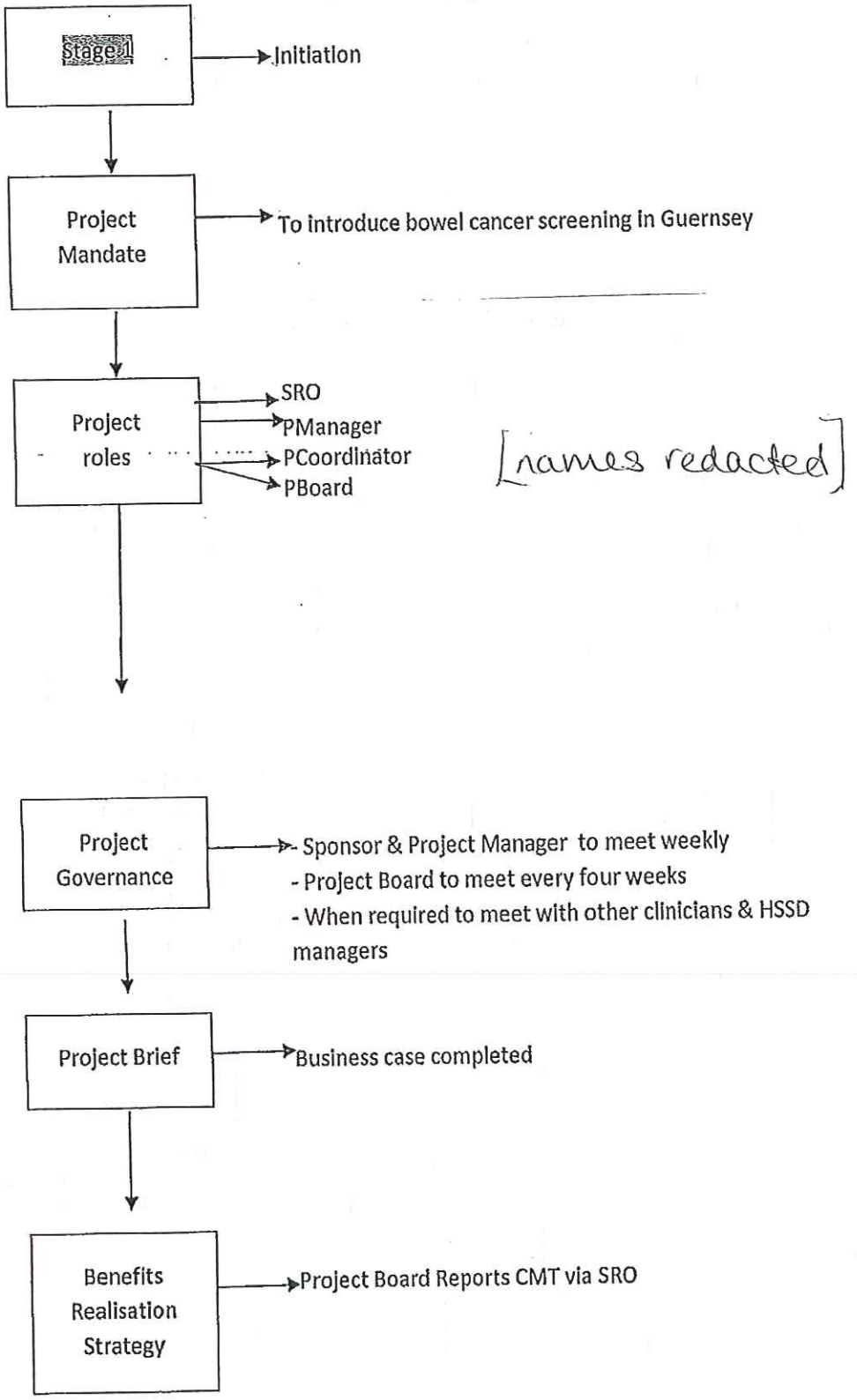
22. Http://www.NSC.nhs.uk/pdfs/summary colorectal.pdf

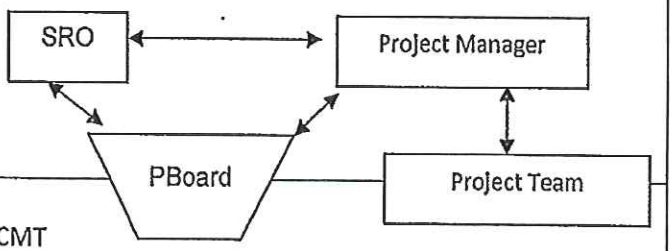
23. MoH Annual Reports

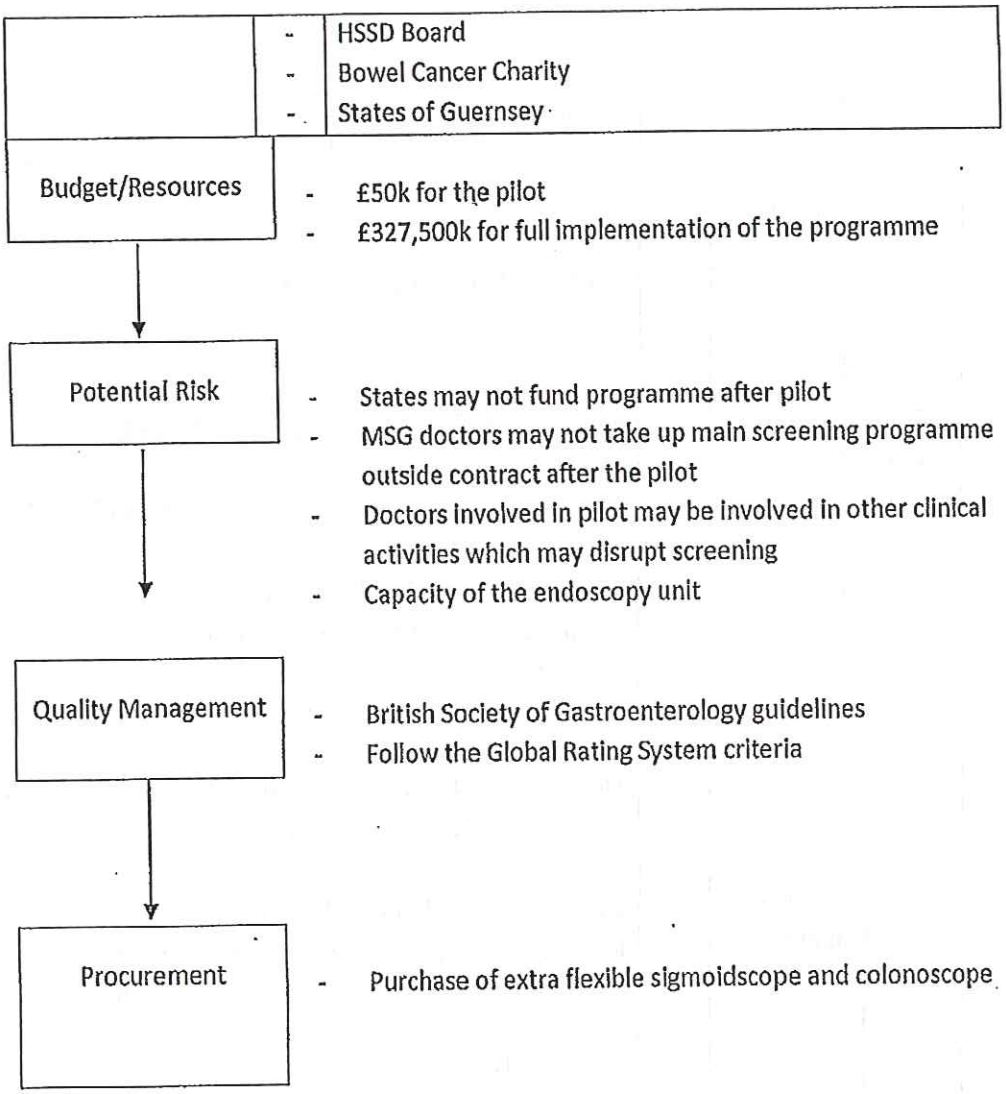
Draft Patient pathway *Appendix 1*

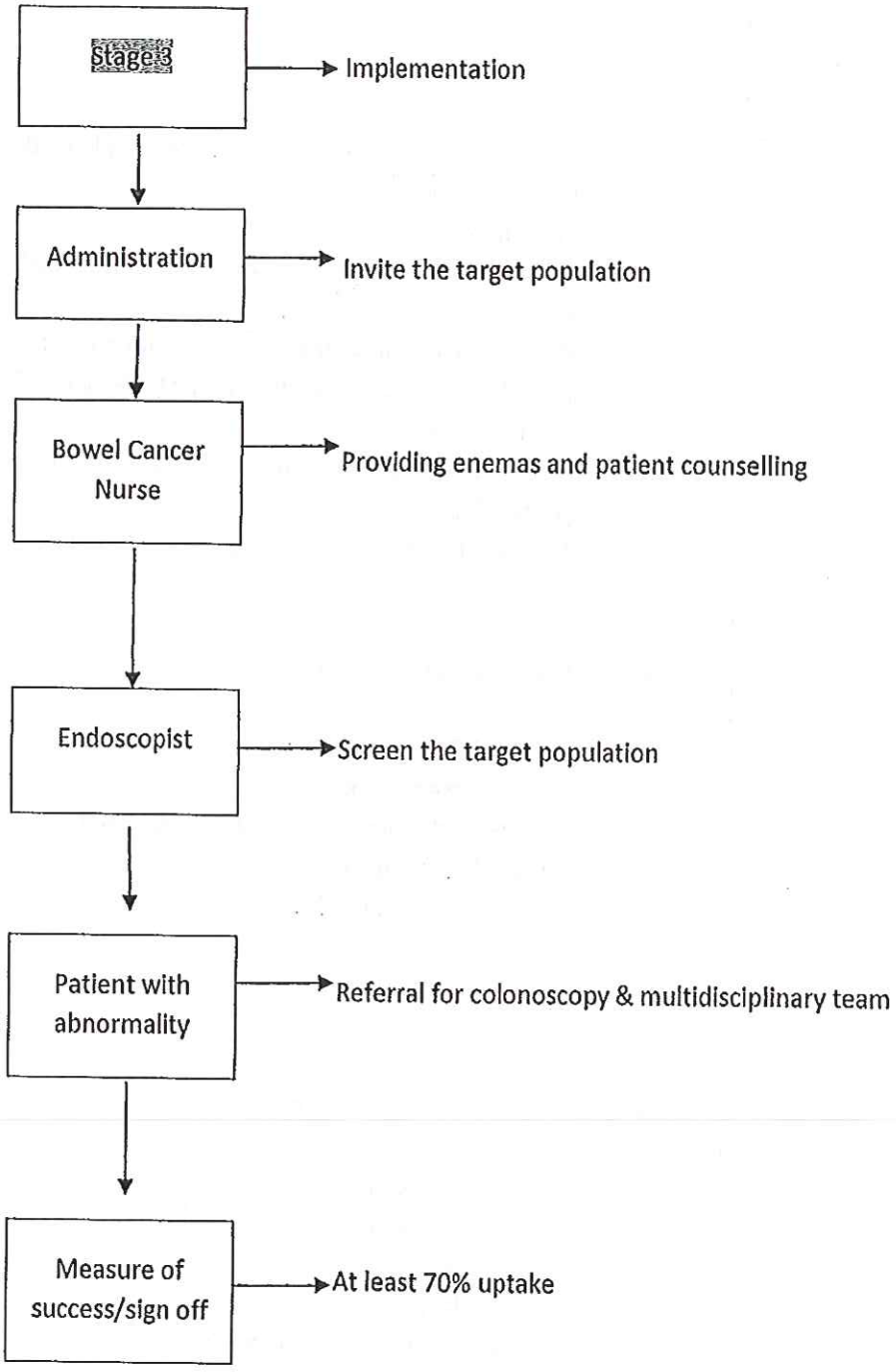


Draft Bowel Cancer Screen Project Plan *Appendix 2*



Stage 2		Planning		
Project Team	-	[names redacted]		
Product description	-	Deliverable/Product based planning (flowchart)		
	-	Sessions to be held on Friday AM & PM		
	-	To introduce bowel cancer screening pilot on 1st October 2011.		
	-	To continue screening thereafter		
	-	To target men & women it two cohorts (age to be determined)		
	-	To offer a seamless transfer of patient with polyps & cancer for colonoscopy and subsequent surgery		
		All patients with detected abnormalities to be discussed at a multidisciplinary team meeting		
Detailed Project Planning	-	To agree on population to be screened		
	-	Identify sessions, times and days for screening		
	-	Ensure endoscopy facilities are adequate to introduce screening		
	-	Adequate IT		
	-	Hold open educational days for the public in Autumn 2011		
		Produce bowel cancer leaflets		
		Project Initiation Document required (PID - template)		
Communication Plan	-			
Stake Holders	-	CMT		


- HSSD Board
- Bowel Cancer Charity
- States of Guernsey
Budget/Resources
- £50k for the pilot
- £327,500k for full implementation of the programme
Potential Risk
- States may not fund programme after pilot
- MSG doctors may not take up main screening programme outside contract after the pilot
- Doctors involved in pilot may be involved in other clinical activities which may disrupt screening
- Capacity of the endoscopy unit
Quality Management
- British Society of Gastroenterology guidelines
- Follow the Global Rating System criteria
Procurement
- Purchase of extra flexible sigmoidscope and colonoscope


Stage 3
Implementation
Administration
Invite the target population
Bowel Cancer Nurse
Providing enemas and patient counselling
Endoscopist
Screen the target population
Patient with abnormality
Referral for colonoscopy & multidisciplinary team
Measure of success/sign off
At least 70% uptake

Stage 4 → Monitoring & Control

- Regular reports of progress, actual versus planned (status reports)
- Pre-emptive risk management
- Quality of the screening process/any cancellation/any complications
- Adequate communication if project not on track
- Reporting & Quality review by Project Manager – formal and informal
- Status report weekly – approved by Project Manager
- (template)
  Highlight report – Approved by Project Board (template)

Stage 5 → Benefits realisation (template)

- Establish final benefits baselines
- Assess achievements
- Post project – benefits realisation handover
- Created by Project Manager
- Approved by the Project Board

Stage 6 → Closure of a Project (template)

- PID objectives/aims met
- Review PID, plan, quality and risk issues
- Outstanding Action Plan
- Lessons learned report
- Performance against time and cost
- Final Statistics
- Created by Project Manager
- Approved by Project Board