Standards for Individuals Performing National Bowel Screening Colonoscopy in New Zealand

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1.19	02/08/21	Amended Cultural Competency and Safety Statement to reference MOH, HDC and MCNZ statements
	02/08/21	Amended to reference MCNZ statement regarding informed consent and Right 5 of the Code of Health and Disability Services Consumer rights in relationship to consent following discussion with Prof Alan Merry.
	02/08/21	Edit to add that detailed Provation Manual is being developed
	27/08/21	Amended contents page heading to Equity and Cultural safety
	28/08/21	Amendments to ADR to read ≤ 55% and comments from NBSP Clinical Oversight Group
	31/08/21	Amended statement on rectal tattooing following consultation with Chairs NZAGS, CRSSANZ
1.20	26/9/21	Edits by Working Group

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Document Sign-off

Role	Name	Sign-off Date
Steering Group	EGGNZ	16/11/2021
EGGNZ Chair	Russell Walmsley	17/11/2021
NBSP Clinical Oversight Group	Susan Parry / Jane O'Hallahan	18/11/2021

Introduction

This document has been compiled by the Individual Standards Working group of EGGNZ, with representatives from the Royal Australasian College of Surgeons (RACS), the Royal Australasian College of Physicians (RACP), the New Zealand Society of Gastroenterologists (NZSG), the Gastroenterology Clinical Network Clinical Reference Group (Gastroenterology CN CRG), the National Endoscopy Quality Improvement Programme (NEQIP), New Zealand Nurses Organisation (NZNO), the New Zealand Conjoint Committee for Recognition of Training in Gastrointestinal Endoscopy (NZCCRTGE), and the New Zealand Association of General Surgeons (NZAGS), in conjunction with the Clinical Director of the National Bowel Screening Programme (NBSP) and representative of the regional NBSP endoscopy quality leads.

It updates the previous 2018 version of the 'Endoscopy *Standards for Individual Colonoscopists Performing Bowel Cancer Screening in New Zealand*' and has been ratified by the larger steering group of EGGNZ. These standards and guidelines will be reviewed in 3 years.

Basic Principles

EGGNZ and the NBSP believe that screening and symptomatic (diagnostic) services should achieve the same minimum levels of quality. To that end much of these standards are also applicable to diagnostic colonoscopy with NBSP-specific standards being annotated as being applicable only to the screening colonoscopies undertaken in the National Bowel Screening Programme of the Ministry of Health.

Equity and Cultural safety

All NBSP colonoscopists are expected to have a common understanding of equity as a foundation for achieving health and wellness. The following agreed Ministry of Health definition of equity aligns with Te Tiriti o Waitangi as it relates to the New Zealand context [1].

"In Aotearoa New Zealand, people have differences in health that are not only avoidable but unfair and unjust. Equity recognises that different people with different levels of advantage require different approaches and resources to get equitable health outcomes".

Te Tiriti o Waitangi Principles

Tino rangatiratanga: The guarantee of tino rangatiratanga, which provides for Māori self-determination and mana motuhake in the design, delivery, and monitoring of *health and disability services*.

Equity: The principle of equity, which requires the Crown to commit to achieving equitable health outcomes for Māori.

Active protection: The principle of active protection, which requires the Crown to act, to the fullest extent practicable, to achieve equitable health outcomes for Māori. This includes ensuring that it, its agents, and its Treaty partner are well informed on the extent, and nature, of both Māori health outcomes and efforts to achieve Māori health equity.

Options: The principle of options, which requires the Crown to provide for and properly resource kaupapa Māori *health and disability services*. Furthermore, the Crown is obliged to ensure that all *health and disability services* are provided in a culturally appropriate way that recognises and supports the expression of hauora Māori models of care.

Partnership: The principle of partnership, which requires the Crown and Māori to work in partnership in the governance, design, delivery, and monitoring of *health and disability services*. Māori must be co-designers, with the Crown, of the primary health system for Māori.

Te Kaunihera Rata o Aotearoa I Medical Council of New Zealand

This document should be interpreted in a manner that is consistent with the MCNZ Statement on cultural safety (2019) [2].

Health and Disability

This document should be interpreted in a manner that is consistent with 'NZS8134 Health and Disability Service Standards 2021' with the 'Code of Health and Disability Services Consumers' Rights Regulations 1996 [3] [4]

Outline of terminology

The standards are qualified into:

- **Quality Standards**, that have measurable and recognised *Key Performance Indicators* (KPIs)
- **Auditable Outcomes** which are measurable items for which there are no defined KPIs and
- **Practice Guidelines** which are items that are not suitable for measurement but contribute to uniformity of good practice.

Standards are further categorised into:

- **Essential,** when they are a requirement for NBSP to commence, or
- **Aspirational**, which are standards recognised to be more difficult to achieve but should be possible within 2 years.

KPIs for screening colonoscopies will be audited 3 monthly by the NBSP, and for diagnostic colonoscopies on a 6 monthly basis as per the New Zealand Global Rating Scale (NZGRS) [5] by individual endoscopy units.

The outline of good quality colonoscopy has been summarised into Recommended Techniques. These cannot be measured directly so cannot be considered as obligatory standards.

This work is based on review of international standards and guidelines listed in Supporting Documents, and peer review papers, listed in References.

Standard 1.0 Qualifications, Experience and Skills of Colonoscopists (Quality Standard)

Standard 1.1: Qualifications

Endoscopists will be legally qualified to perform colonoscopy in a NBSP unit.

Rationale	***There are basic prerequisite qualifications to perform a colonoscopy in any endoscopy unit.***	
Essential criteria	1.1a	A valid Annual Practising Certificate with an appropriate vocational scope with the New Zealand Medical or Nursing Council.
	1.1b	Local credentialing to perform colonoscopy [6]
Evaluation process	Certification	
Evaluation targets	All criteria are met.	

Standard 1.2: Previous experience and level of performance ***Colonoscopists will have the necessary proven level of performance***		
Rationale	NBSP cases will have more pathology than symptomatic or surveillance procedures therefore colonoscopists must have met recognised Key Performance Indicators.	
Essential criteria	1.2a	*Previous Colonoscopy Experience:* Independently completed **at least** 150 colonoscopies over 3 consecutive years [7].
	1.2b	*Level of performance:* Provide. a. Caecal Intubation Rate (unadjusted) >90%, b. Adenoma Detection Rate (ADR) of at least 25% in all patients aged > 50 years, with intact colons [7]. **OR,** if ADR has not been recorded; c. Withdrawal time (in non-interventional cases only) >6min for 90% of colonoscopies.
Evaluation process	1.2a - Verifiable records from endoscopy units where endoscopy is undertaken 1.2b - Verifiable evidence of achievement of the Key Performance Indicators (KPIs) taken on at least the last consecutive 100 colonoscopies, at any institution.	
Evaluation targets	All criteria are met.	

Aspirational Performance Indicators

Evidence of post-polypectomy bleeding rate, perforation rate and post-polypectomy perforation rate (which are likely to be necessary to be collated over a longer period) is encouraged [8].

In future, completion of certification or re-certification in colonoscopy will be mandatory.

Standard 1.3: Endoscopic Skills ***Colonoscopists will have a verifiable appropriate skill set***		
Rationale	NBSP procedures involve polyp detection, recognition, classification, and removal with appropriate skill set.	
Essential criteria	1.3a	Level 3 competency of polypectomy (up to 2cm flat lesions).
	1.3b	Competence in biopsy
	1.3c	Submucosal injection
	1.3d	Polyp retrieval
	1.3e	Tattooing
	1.3f	Endoscopic haemostasis, including use of haemostasis clips
Evaluation process	Evaluation by NBSP clinical leads. Assessment of these skills can be done by Directly Observed Procedural Skills (DOPS) assessment (RACP/RACS-approved forms [9]) and DOPyS (EGGNZ-approved) UK JAG form [10].	
Evaluation targets	DOPS x 2; assessed to be "Competent for Independent Practice". DOPS Colonoscopy - assessed to be 'Independent' in all domains.	

Aspirational Endoscopic Skills
Level 4 (EMR) polypectomy should be undertaken by designated locally recognised experts *(See Appendix A).*

Standard 1.4: Sedation Skills ***Colonoscopists will have verifiable, appropriate skills in moderate sedation***		
Rationale	The majority of NBSP procedures will be undertaken with moderate sedation (also known as 'conscious sedation'), administered by the colonoscopist.*	
Essential criteria	1.4a	Local credentialing in moderate sedation, (see EGGNZ Guidelines on Credentialing in Endoscopy, Section 1.1 [6]).
Evaluation process	Evaluation by clinical leads. While there is no agreed formal process of assessment EGGNZ support the ANZCA outline of Competencies for Safe Procedural Sedation [11]. Formal assessment of knowledge can be undertaken by completion of the online Safe Sedation Training endorsed by EGGNZ and the American Society of Anaesthesiologists (https://www.safesedationtraining.com).	
Evaluation targets	Evidence of Credentialing by the local or DHB Endoscopy Users Group (EUG).	

* As per standard 1.7f in EGGNZ/MoH Unit Service and Facility Standards for New Zealand [12], access is required to an anaesthetic – assisted sedation list, where General Anaesthesia or deep sedation can be given. Administration of Propofol or Ketamine should be by appropriately trained and credentialed sedationists as per Section 10, of Guideline on Sedation and / or Analgesia for Diagnostic and Interventional procedures [PS09] ANZCA [13].

Aspirational Sedation Skills.

Many patients prefer no sedation or, because of health or social reasons, require alternatives to intravenous sedation. An acceptable alternative is Nitrous Oxide (Nitronox^{TM}). NBSP colonoscopists are recommended to have awareness of local policies and guidelines in the use of Nitronox^{TM}.

Standard 2 – Bowel Preparation

Standard 2.1: Bowel Preparation
The preparation of the colon will be of sufficient standard to allow for high quality colonoscopy.

Rationale	The rationale behind the NBSP is to detect neoplastic lesions at an earlier stage and prevent cancer by removing small pre-malignant growths. In order to achieve this, the view of the mucosa must be unobscured by provision of good quality bowel prep. Inadequate bowel preparation is associated with lower ADR, longer procedure time, increased need for repeat procedures; higher cost and a higher rate of patient drop out from screening programs [14], [15], [16], [17], [18], [19] [20]. The colonoscopist has a responsibility to be involved in the bowel preparation process and to record, in a systematic way, the success or otherwise of the bowel preparation to facilitate quality control.	
Essential criteria	2.1a	The Quality of Bowel Prep is recorded using the Boston Bowel Prep score [21].
Evaluation process	Assessment of ProVation reports exported to the National Screening Solution by the Ministry of Health.	
Evaluation targets	!00%; all colonoscopy reports should state Quality of Bowel Prep entered.	

See Appendix C for further guidance on bowel preparation.

Standard 3 – Process of Consent

Standard 3.1: Consent
The consent to undergo a colonoscopy shall cover a minimum number of points, with specified risks

Rationale	Consent to undergo a Bowel Screening Colonoscopy is a process, like any other consent to treatment, and does not occur at one point in time and should be comprehensive and specific to the procedure. Consent is expected to be obtained in compliance with the updated New Zealand Medical Council guidelines [https://www.mcnz.org.nz/assets/standards/c43a3affc3/Statement-on-informed-consent.pdf].
Essential criteria	The colonoscopist is responsible for ensuring that:

3.1a	The participant*/person signing consent understands the procedure
3.1b	The participant*/person signing consent understands the associated risks
3.1c	The Participant* /person has been able, if they would like, to involve others close to them in the informed consent process.
3.1d	The participant*/person signing consent is given an opportunity to ask the endoscopist any questions
3.1e	The consent document should indicate that, at a minimum, the following aspects have been discussed (indicative rates for NBSP): a. Sedation risk b. Overall perforation rate (1 in 1000) c. Post polypectomy perforation rate (1 in 500) d. Post polypectomy bleeding rate (1 in 100) e. Missed clinically important lesion rate (5-10%)
3.1f	All consent forms are signed by the patient or their representative before the patient enters the endoscopy room.
3.1g	Permission to dispose of or return tissue is indicated
3.1h	The presence of the patient's and endoscopist's signature on a consent form
3.1i	Endoscopic Time Out is completed before sedation is given or the procedure commenced

Evaluation process	Internal and external audit processes are used to ensure that the criteria are complied with and identified risks or issues are addressed through a CQI process and the Quality Plan.
Evaluation targets	3.1 a, b, c, d and f are practice points, without auditable outcomes. 3.1 e, g, h and i are auditable outcomes, with requirement of 100%.

*MOH note for NBSP;

- Participant is used in line with NSU wide documentation
- In keeping with the special duty of care to patients in screening programmes it is expected that the admission process includes a further opportunity, if at all possible, when the participant is still fully dressed, to both discuss the procedure and associated risks and involve others close to them, if they wish. Nurse led consent can support this process.

Standard 4.0 Recommended techniques for quality colonoscopy

Standard 4.1: Techniques

To help ensure uniformity of quality, the proposed techniques should be used in all colonoscopies.

Rationale	Delivery of a high quality colonoscopy will ensure that premalignant and malignant lesions are identified, successfully removed and, together with review of histology, give confidence on which to base further polyp surveillance [22].	
Recommended Techniques	4.1a	CO_2 and/or water should be used for insufflation.
	4.1b	Retroflexion in rectum should be performed.
	4.1c	Biopsies of the terminal ileum to document a complete colonoscopy is unnecessary and discouraged. Photography is recommended instead
	4.1d	Inspection of the right colon in retroflexion should be attempted where technically possible and comfortable for the patient. If not achieved, a second forward view inspection should be undertaken, preferably with the patient in a different position.
	4.1e	Dynamic positioning should be used to maximise mucosal viewing.
	4.1f	The following minimum picture set should be taken: a. To record evidence of completion of procedure: i. Appendiceal orifice, and ii. Either caecum with IC valve or terminal Ileum b. To ensure common blind spots reviewed: i. Rectum (retroflexed) c. To aid in audit of complications and recurrence: i. Site of significant interventions – before, during and after. d. Additional pictures of: i. Polyps >1cm or worrying morphology ii. Post-polypectomy lesions >1cm iii. Interventional procedures – haemostasis, clipping iv. All tattoo sites
	4.1g	Endoscopists should use electronic virtual chromoendoscopy e.g. Narrow Band Imaging (NBI), i-scan or Flexible Spectral Imaging Colour Enhancement (FICE), when available.
	4.1h	Description of polyp morphology should be by the Paris criteria, in order to assist decisions of treatment/tattooing. Aspirational -Standard 7.
	4.1i	Analysis of polyp pit pattern by NICE, JNET, or KUDO criteria is encouraged, in order to assist decisions of treatment /tattooing.
	4.1	Polypectomy techniques should follow those described in the US Multi-Society Task Force recommendations [23]
	4.1k	Lesions of >15mm or worrying lesions (by morphology/pit pattern analysis) should be tattooed with carbon suspension with the exception of rectal lesions that are palpable by digital examination. The tattoo should be 2cm distal to the lesion (i.e. on the anal side) and on two opposite sides of the bowel. We recommend raising a submucosal bleb with saline first to minimise peritoneal or mesorectal tattoo.
Evaluation process	Internal audit processes are used to ensure that the techniques are complied with.	
Evaluation targets	Only qualitative targets. All criteria are met.	

Standard 5.0 Electronic Report Content for National Bowel Screening Programme Colonoscopy (NBSP) (Auditable Outcome)

Standard 5.1: Electronic Report Content

The electronic report shall have minimum content/data set.

Rationale	Standardised minimum content allows for both easier centralised collection of auditable data and uniformity of information given to participants and practitioners across New Zealand.	
Essential criteria	5.1a	Indication for procedure
	5.1b	Family history of bowel cancer
	5.1c	Type of procedure a. Colonoscopy, b. Post – surgical colonoscopy
	5.1d	Relevant co-morbidities or ASA grade, especially those associated with increased risk for sedation, consequences of complications, or anticoagulant management.
	5.1e	Boston Bowel Prep Score a. taken on withdrawal, b. individual segments and c. total
	5.1f	Endoscope(s) used
	5.1g	Sedation, and other medications, with precise dose
	5.1h	Assessment of the degree of difficulty of the procedure
	5.1i	Maximum extent of intubation
	5.1j	Reason if not complete
	5.1k	Patient comfort using the Gloucester Comfort Scale*
	5.1l	Withdrawal time (time when the endoscopist starts detailed inspection of the colonic mucosa, i.e. not from the time the caecal pole is identified, but after any inspection of the terminal ileum)
	5.1m	For each abnormality detected: a. Site b. Distance from anorectal junction, if less than 20cm c. Sector nomination (caecum, ascending, transverse, descending colon, sigmoid, rectum) d. Size / Morphology i. Maximum diameter in millimetres ii. Paris criteria or pedunculated / semi-pedunculated / sessile and, in case of lateral spreading tumour, granular or non-granular. e. Manoeuvre (Biopsy, resection [with technique], tattooing, haemostasis etc]
	5.1n	For endoscopic therapy: a. Technique (e.g. hot or cold polypectomy, adrenaline injection etc.) b. Complications c. Completeness (of resections)

	5.1o	Minimum picture set: a. To record evidence of completion of procedure: i. Appendiceal orifice ii. And either caecum with IC valve or terminal Ileum b. To ensure common blind spots reviewed: i. Rectum (retroflexed) c. To aid in audit of complications and recurrence: i. Site of significant interventions – before, during and after. d. Additional pictures of: i. polyps >1cm or worrying morphology ii. Post polypectomy lesions >1cm iii. Interventional procedures – haemostasis, clipping iv. All tattoo sites
	5.1p	Recommendations for follow up consistent with the requirements of the NBSP.

Non-essential

	5.1q	Preparation / Bowel cleansing regimen
	5.1r	Abnormalities described using pit pattern
Evaluation process	External assessment processes ensure that criteria are complied with and identified issues are addressed through the CQI process and quality plan.	
Evaluation targets	No quantitative target. All criteria are met.	

Guidance

*5.1k Gloucester Comfort Scale is reported, and preferably entered into the report by the nurse and not by the endoscopist.

See Appendix B for guidance on how to fill in a ProVation NBSP colonoscopy report.

See Appendix D for guidelines on recommended techniques

Standard 6.0 Delivery of Report (Auditable Outcome)

Standard 6.1: Delivery of Report

Summary of the colonoscopy procedure, with appropriate content, is to be provided for the patient before discharge from the unit.

Rationale	Patients require written information / instructions after their endoscopy to refer to once they have left the unit, to ensure safety and early detection of complications and plan for future care.	
Essential criteria	6.1a	Before leaving the endoscopy unit, patients should be given a verbal explanation of the results of their procedure.*
	6.1b	Patients should also be given written information to support the verbal explanation.
	6.1c	Written information must include: a) findings b) symptoms to watch out for, and where to seek help c) when to resume eating /drinking, and appropriate diet d) when to resume or take relevant medications including anticoagulants and antiplatelet therapy e) when it is appropriate to drive or operate heavy machinery f) contact numbers g) recommendations for follow up
Evaluation process	External assessment processes ensure that criteria are complied with and identified issues are addressed through the CQI process and quality plan.	
Evaluation targets	No quantitative target. All criteria are met.	

Guidance

*6.1a It is recommended that this is undertaken by the endoscopist, or at least a senior nurse involved in the NBSP.

Standard 7.0 Performance standards for colonoscopies undertaken for NBSP.

* Note: these KPIs apply only to outcomes of colonoscopies performed as a result of a positive FIT in the NBSP. It is recognised internationally that higher numbers of colonoscopies performed by individual colonoscopists statistically equate with improved outcomes, but we also recognise the importance of accessibility to NBSP colonoscopy in every DHB.

Standard 7.1: Individual Performance

NBSP colonoscopists will perform procedures to a uniform high minimum level

<table>
<tr><td>Rationale</td><td>Fundamental to ensuring quality of the diagnostic intervention of the NBSP is on-going audit.</td></tr>
<tr><td>Essential criteria</td><td>In order to maintain as high a standard as possible we believe that those colonoscopists performing NBSP procedures should undertake a minimum of:
<table>
<tr><td>7.1a</td><td>40 endoscopy lists per year
150 colonoscopies over 3 years</td></tr>
</table>
KPIs
<table>
<tr><td>7.1b</td><td>Withdrawal time minimum of >6 mins in ≥90% of negative (non-interventional) colonoscopies</td></tr>
<tr><td>7.1c</td><td>Caecal Intubation Rate (CIR, unadjusted) minimum >95%</td></tr>
<tr><td>7.1d</td><td>Adenoma Detection Rate (ADR) ≥ 55%</td></tr>
<tr><td>7.1e</td><td>Polyp retrieval rate minimum >95% (unadjusted)</td></tr>
</table>
The following information should be considered essential audit for internal quality purposes (Auditable Outcomes)
<table>
<tr><td>7.1f</td><td>Gloucester Comfort Scale, < 4 (moderate discomfort) in >90% cases</td></tr>
<tr><td>7.1g</td><td>Sedation Drug dose</td></tr>
<tr><td>7.1h</td><td>Retroflexion in the rectum > 90%</td></tr>
<tr><td>7.1i</td><td>The percentage of detected cancers and polyps >15mm (based on preliminary NBSP pilot data, approx. 5% of 15mm polyps removed contain cancer) or with suspicious morphology or pit pattern analysis at any size, are marked by a tattoo, with the exception of rectal lesions that are palpable by digital examination</td></tr>
</table></td></tr>
<tr><td>Evaluation process</td><td>External assessment processes* via Provation Centralised Database and NSS.
Interpretation of KPIs for less than 100 cases should be applied with caution.
*All KPIs Auditable and outcomes of NBSP colonoscopies are monitored by the NBSP and the NBSP Colonoscopy Quality Assurance Group (ColQAG). Results are made available to DHB NBSP Clinical Leads and NBSP Regional leads.</td></tr>
<tr><td>Evaluation targets</td><td>Quantitative and qualitative target. All criteria are met.</td></tr>
</table>

Aspirational

1. Polyps will be described by the Paris classification.
2. Polyp pit pattern will be described using Kudo or NICE (if /when available on ProVation) classification in all worrying lesions or those >1.5cm. Standard 100%. (see Appendix E).

Note: New measures (e.g. serrated polyp detection rate or mean numbers of adenoma per procedure) may be introduced as a future KPI.

Standard 7.2: Unit Performance

Key performance indicators relating to the overall performance of the endoscopy unit in reference to NBSP.

Rationale	***Some KPIs are too infrequent to be sensibly reported on an individual level and so for each endoscopy unit the KPIs are accumulated.***	
Essential criteria	7.2a	Overall perforation rate < 1 in 1000 [24], [25]
	7.2b	Post polypectomy perforation rate < 1 in 500 [8]
	7.2c	Post polypectomy bleed < 1 in 100 [25], [26]
	7.2d	Serious Adverse Events** < 5/1000 [8]
	7.2e	Correct completion of consent forms - 100%
	7.2f	Correct completion of Endoscopic Time Out forms. – 100%
	The following information should be considered essential audit for internal quality purposes (Auditable Outcomes)	
	7.2g	Use of reversal agents
	7.2h	Bowel prep score • The quality of bowel preparation should therefore be at least "adequate' or >/= 6/9 on the Boston Bowel Prep Scale with no single score < 2 (i.e. not requiring repeat procedure) in > 95% of NBSP cases**.** #
	7.2i	Cancer detection rate per 100 NBSP colonoscopies *
	7.2j	Post colonoscopy CRC rate *
Evaluation process	External assessment processes ensure that criteria are complied with and identified issues are addressed through the CQI process and quality plan.	
Evaluation targets	No quantitative target. All criteria are met.	

Guidance

*In line with current international assessments

** Adverse events that meet Intermediate or higher classification as per [8]

Standard 5.7i, Endoscopy Unit Service and Facilities states a target of 90%. [12] This recommendation supersedes that to conform with the NBSP Interim Quality Standard 7.3 that <5% of colonoscopies will require repeating as a result of poor bowel preparation.

Standard 8.0 Continuing Endoscopic Medical Education (Auditable Outcome)

Standard 8.1: Continuing Endoscopic Medical Education

NBSP colonoscopists will keep themselves up to date with endoscopic technology and techniques.

Rationale	As endoscopy practice is ever changing it is highly recommended that NBSP colonoscopists also take a reflective view of their practice.	
Essential criteria	8.1a	Participate in continuing colonoscopy medical education and quality improvement programmes including Direct Observation of Procedural Skills (DOPS).
	8.1b	Attend Continuing Endoscopic Medical Education (CME-E) at least every 3 years.*
	8.1c	Attend appropriate Multidisciplinary meetings
Evaluation process	Internal audit by DHB NBSP clinical lead.	
Evaluation targets	All criteria are met.	

Aspirational
Comply with future re-certification when this is available/mandated

Undergoing periodic 360-degree feedback.

*Note; There are a number of on-line resources available in endoscopic techniques. One EGGNZ-endorsed site is the Ghent International Endoscopy Quality Symposium (https://www.giegs.com/index.php) which is strongly supported by the founders of the JAG GRS.

Appendix A: Levels of Colonoscopic Competency

Level 0: The operator does not remove any lesions, referring on all patients with any detected lesions. The operator will be able to biopsy lesions and pathological material may inform the decision to refer.

Level 1: Removing lesions <10 mm in diameter at FS. Rationale: larger lesions will indicate a need for colonoscopy and can be removed when the colonoscopy is performed. Tissue is required from smaller lesions to decide whether colonoscopy is necessary.

Level 2: Removing polypoid and sessile lesions <20 mm providing there is good access. All colonoscopists should have this level of competency.

Level 3: Removing smaller flat lesions (<20 mm) that are suitable for endoscopic therapy, larger sessile and polypoid lesions, and smaller lesions with more difficult access. Some flat lesions <20 mm with poor access might be unsuitable for this level. Any person doing colonoscopy for positive faecal occult blood test (FIT) in a screening programme should have this level of competency.

Level 4: Removing large flat lesions or other challenging polypoid lesions that might also be treated with surgery. This is the type of lesion which might not be removed at the first colonoscopy either because of time constraints or because the surgical option needs to be discussed with the patient. If the patient chooses to have endoscopic therapy, then he/she should be referred to a level 4 competent endoscopist. This level of competency would be expected of only a small number of regionally based colonoscopists.
It is recognised that the methodology does not currently exist to reliably recognise who has achieved the proposed levels of competence. Thus, until a competency–based assessment process is available the clinical lead of the service should be satisfied that:

- The professionals have the necessary competence;
- The unit has the necessary equipment; and
- In the event of a serious adverse event, it will be possible to manage the patient locally or transfer the patient safely to another institution with the expertise and facilities to care for the patient.

N.B. A review of capabilities may identify shortcomings that can be addressed with further training or investment. This training and investment should occur before screening begins.

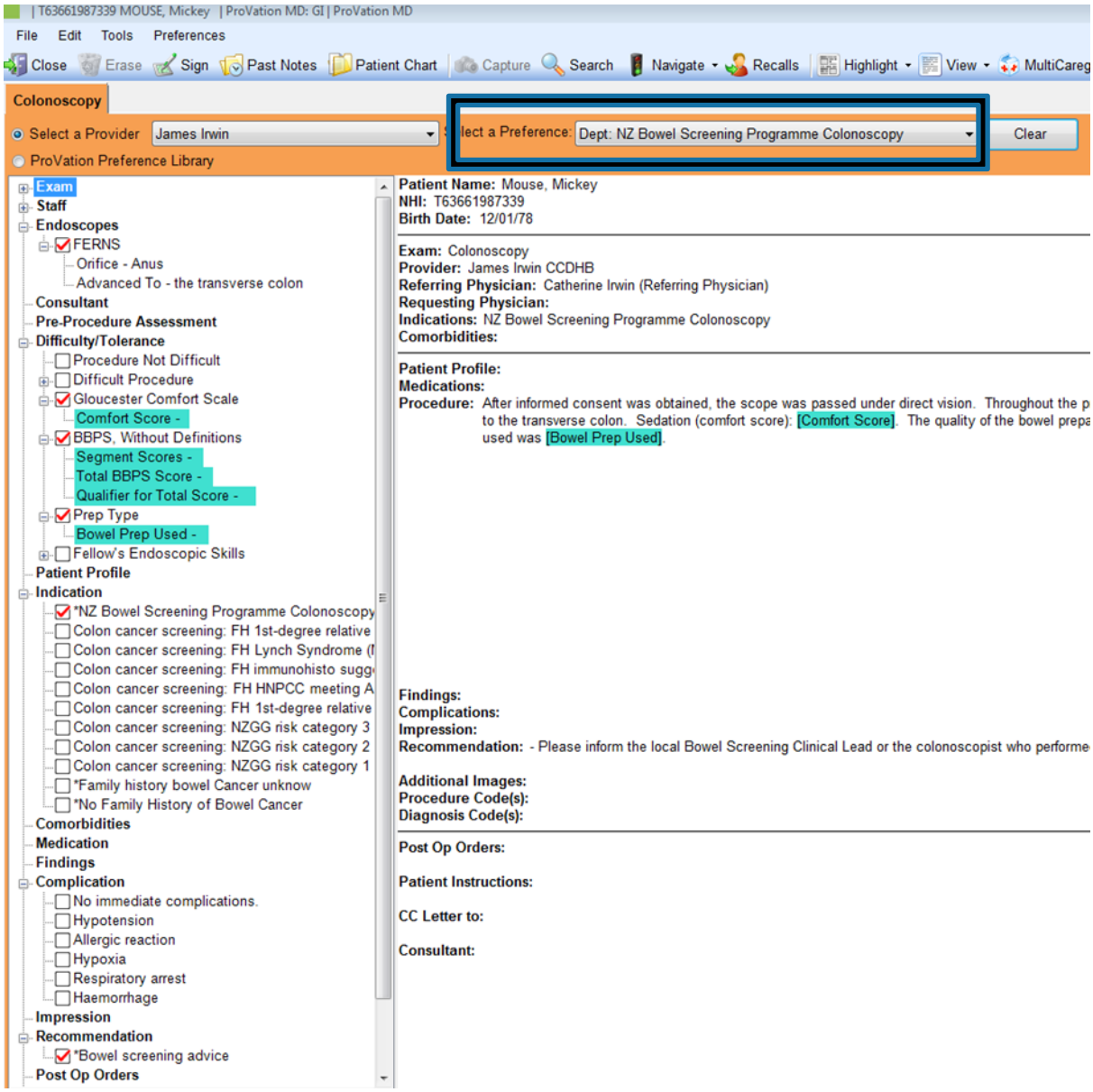
Appendix B: How to fill in a ProVation® NBSP colonoscopy report

(Note: More comprehensive guidance is under development).

Standard 5. Electronic Report Content for NBSP Colonoscopy (Auditable Outcome).

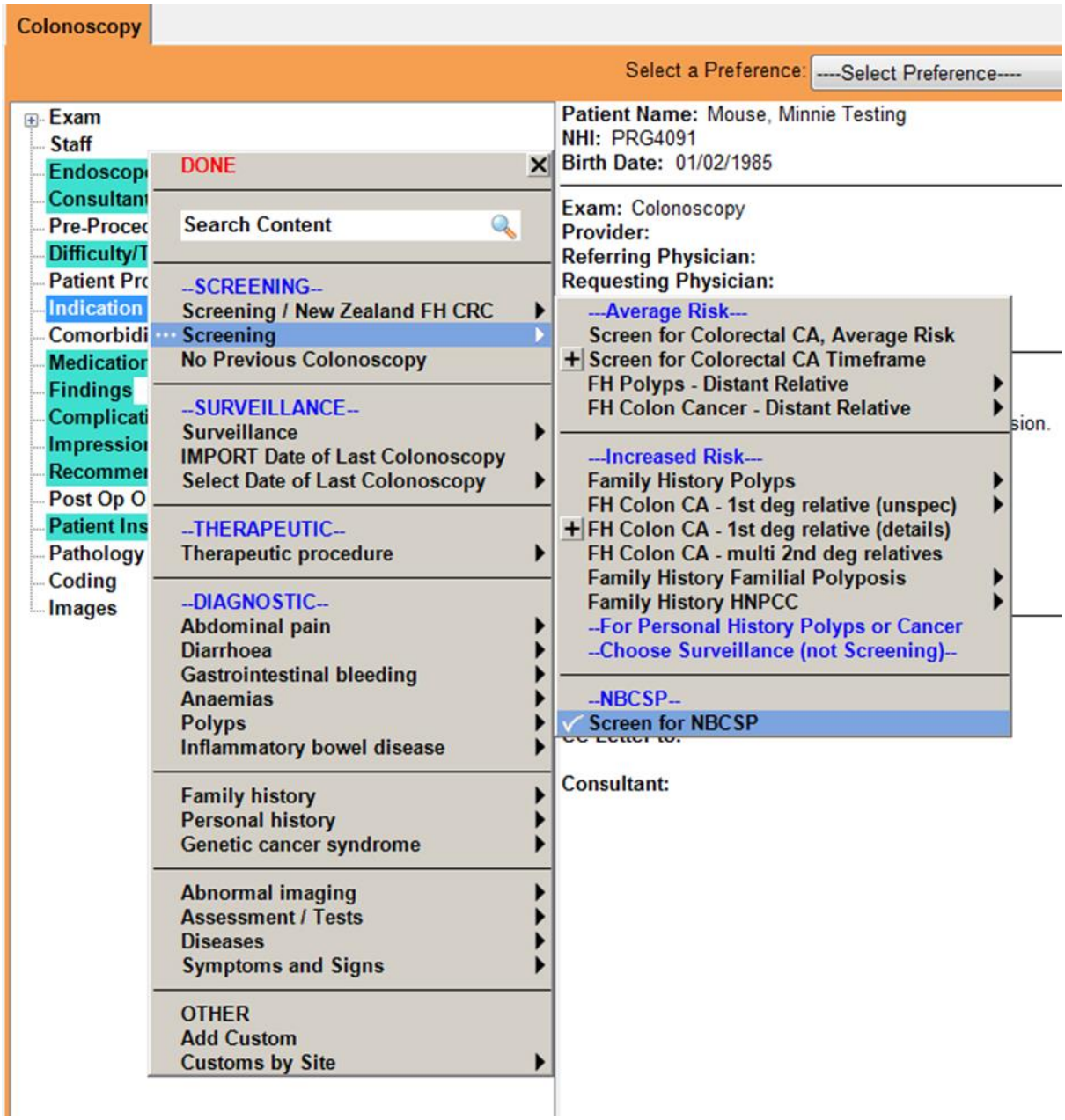
Versions of ProVation differ across the country. Some have the '*NZ Bowel Screening Programme Colonoscopy'* proforma loaded which, when chosen from the top Preference menu (see below),will then prompt completion of the requisite Gloucester Comfort Scale, Boston Bowel Prep, Prep type and a version of Family History of CRC.

Screen shots of the preferred methods of completing a NBSP Screening Colonoscopy without this Proforma follow below.

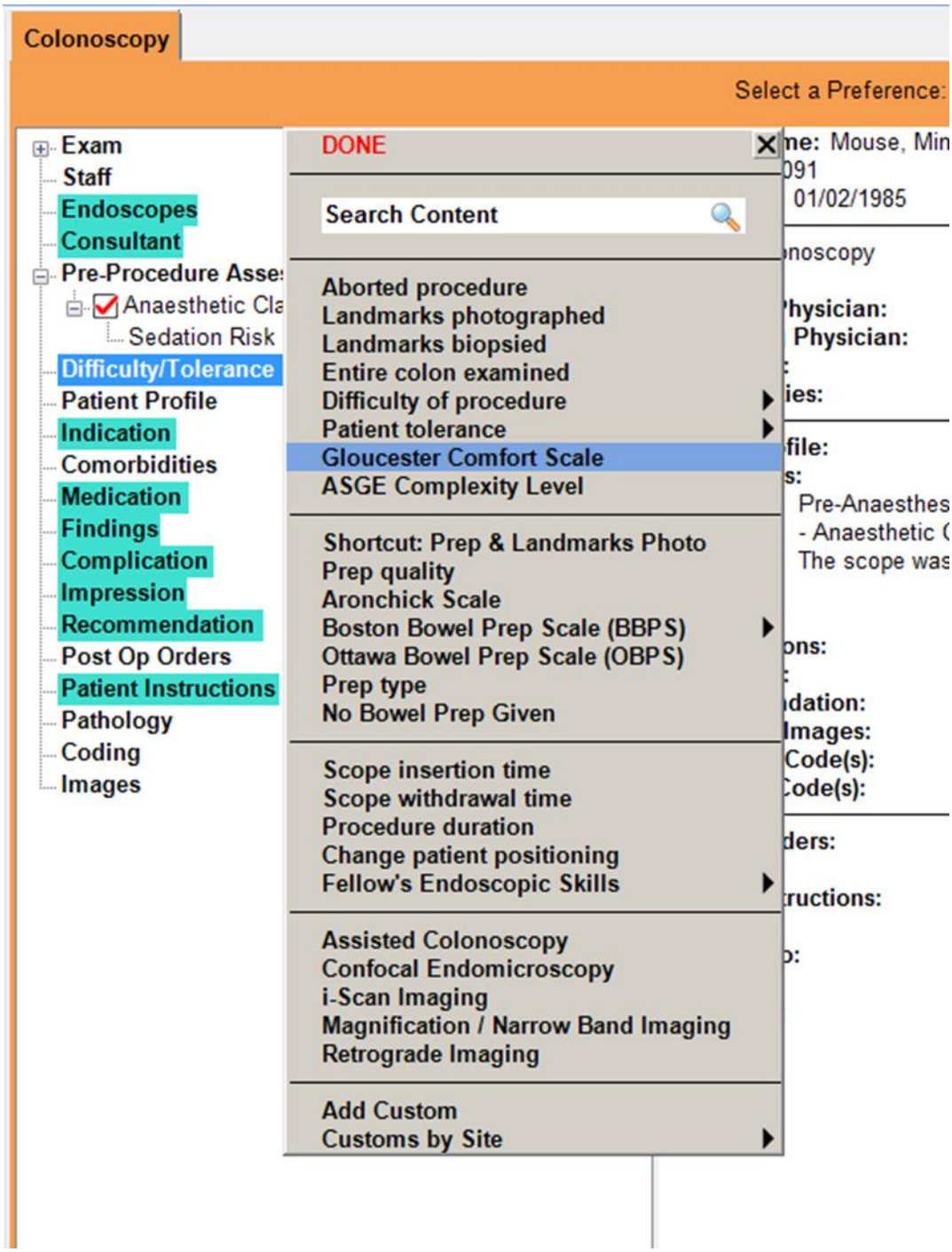


If you don't have this Proforma then select:

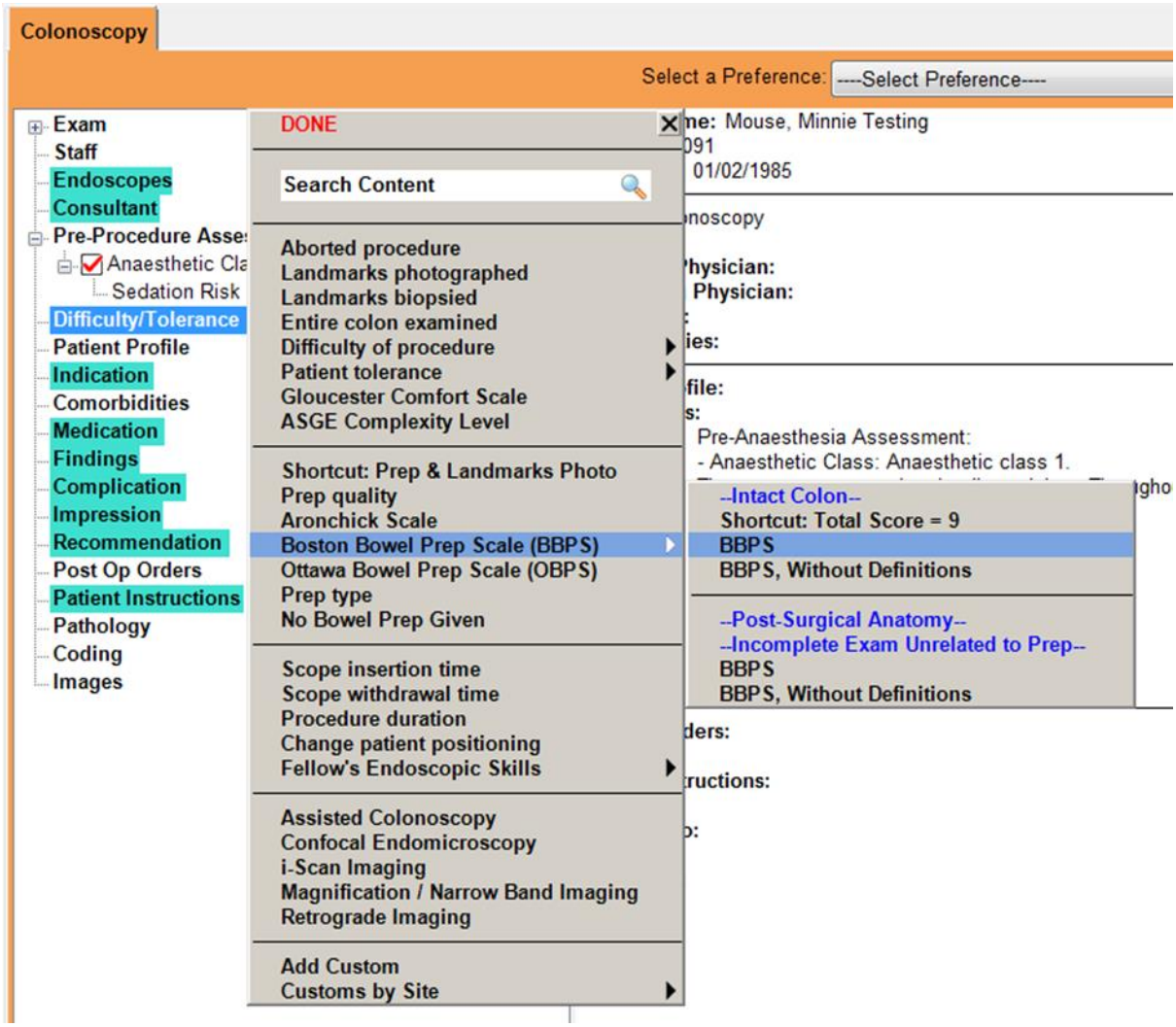
- *Indication*
- *Screening*
- *NBCSP*
- *Screen for NBSCP*



Gloucester Comfort Score (to be completed by nurse or at least after discussion with them) is under *Difficulty/Tolerance*:

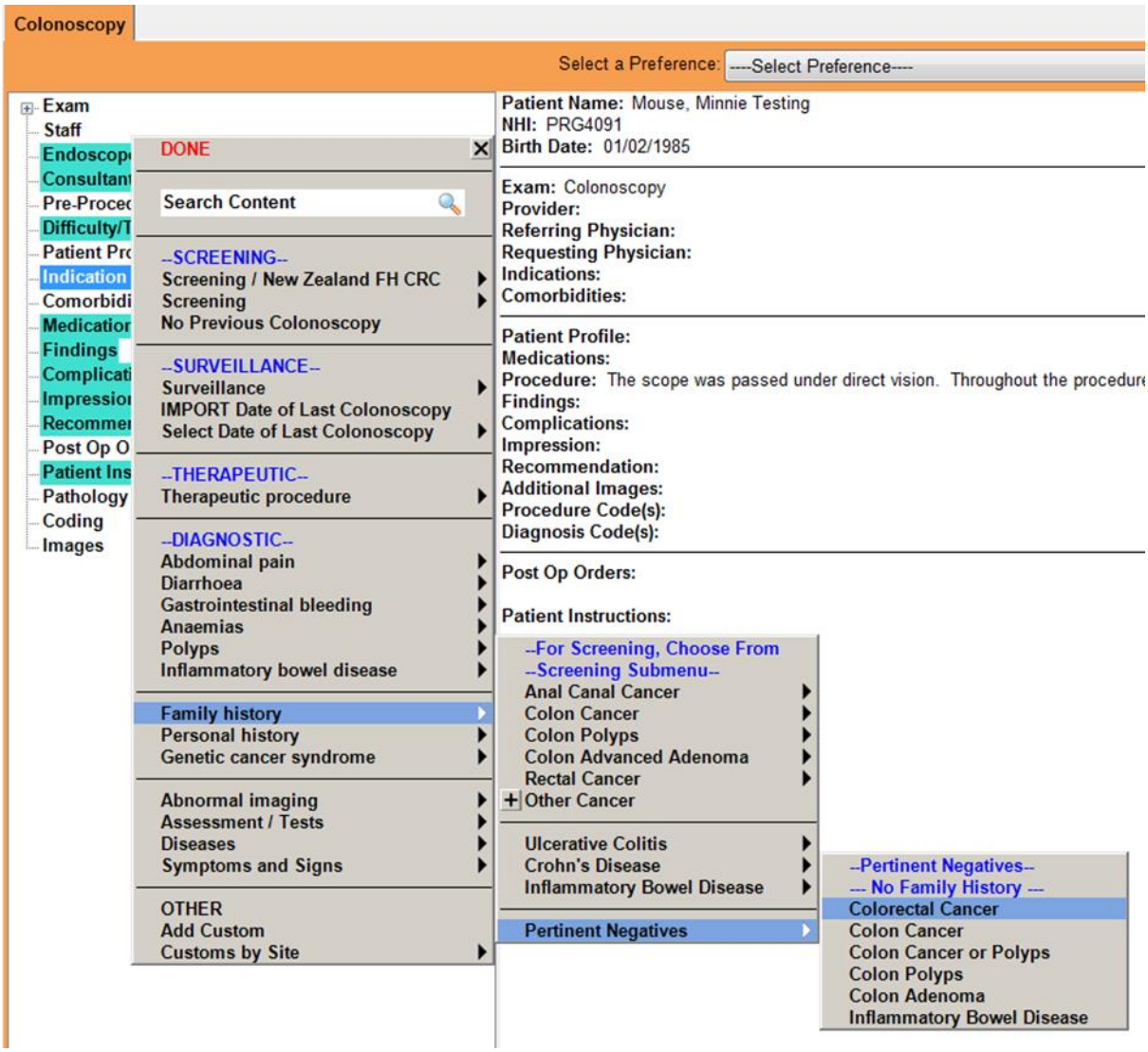


Boston Bowel Prep score is also under Difficulty/Tolerance:

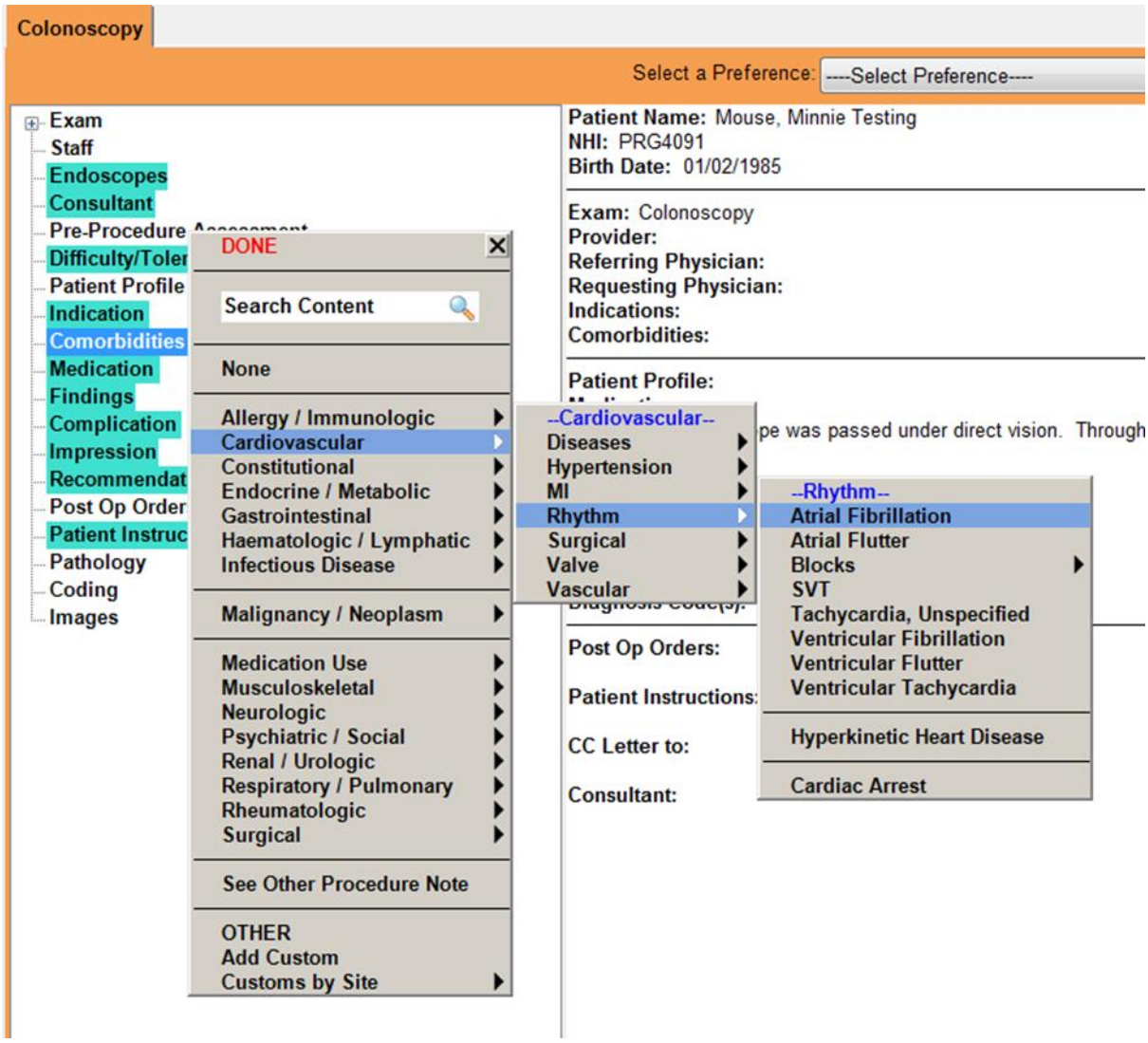


Family History of Colorectal Cancer, with pertinent negative history is found under;

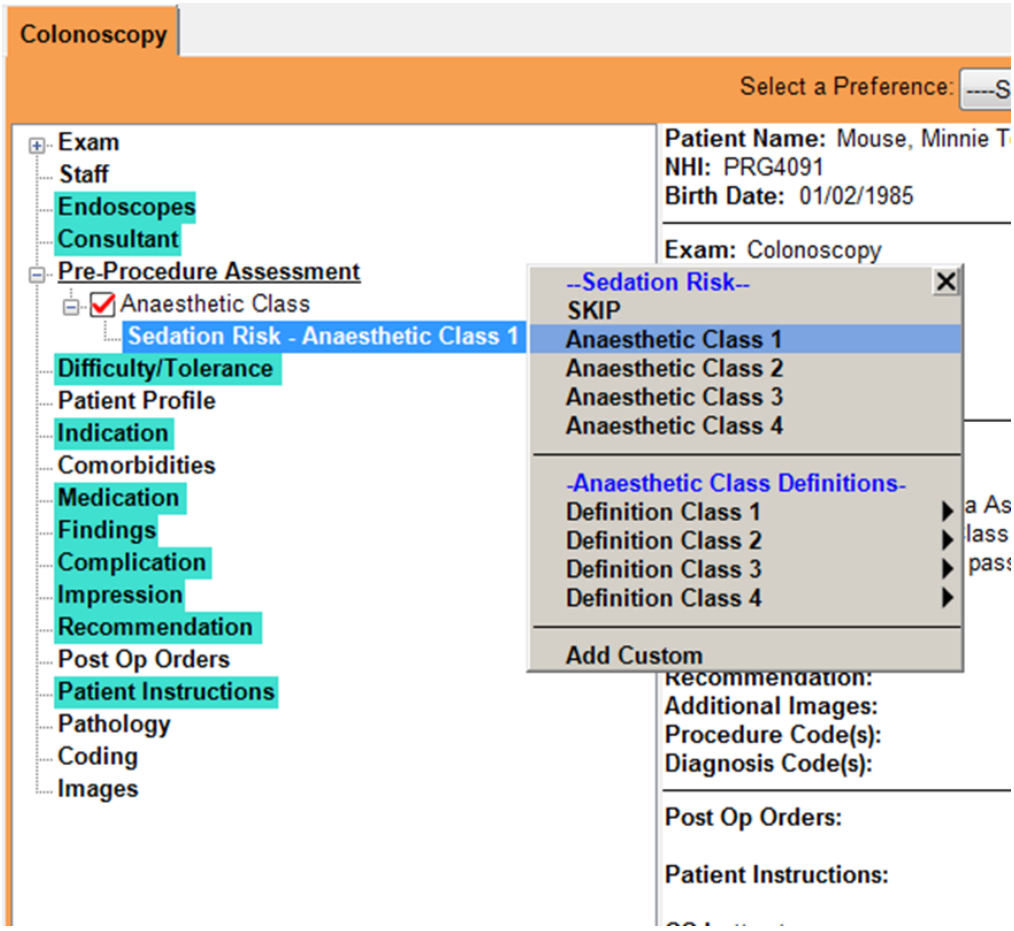
- *Indications*
- *Family History*



Comorbidities that are relevant to performing the procedure, including indications for anticoagulation, should be completed. A non-extensive list is found under the *Comorbidities* tab*:*



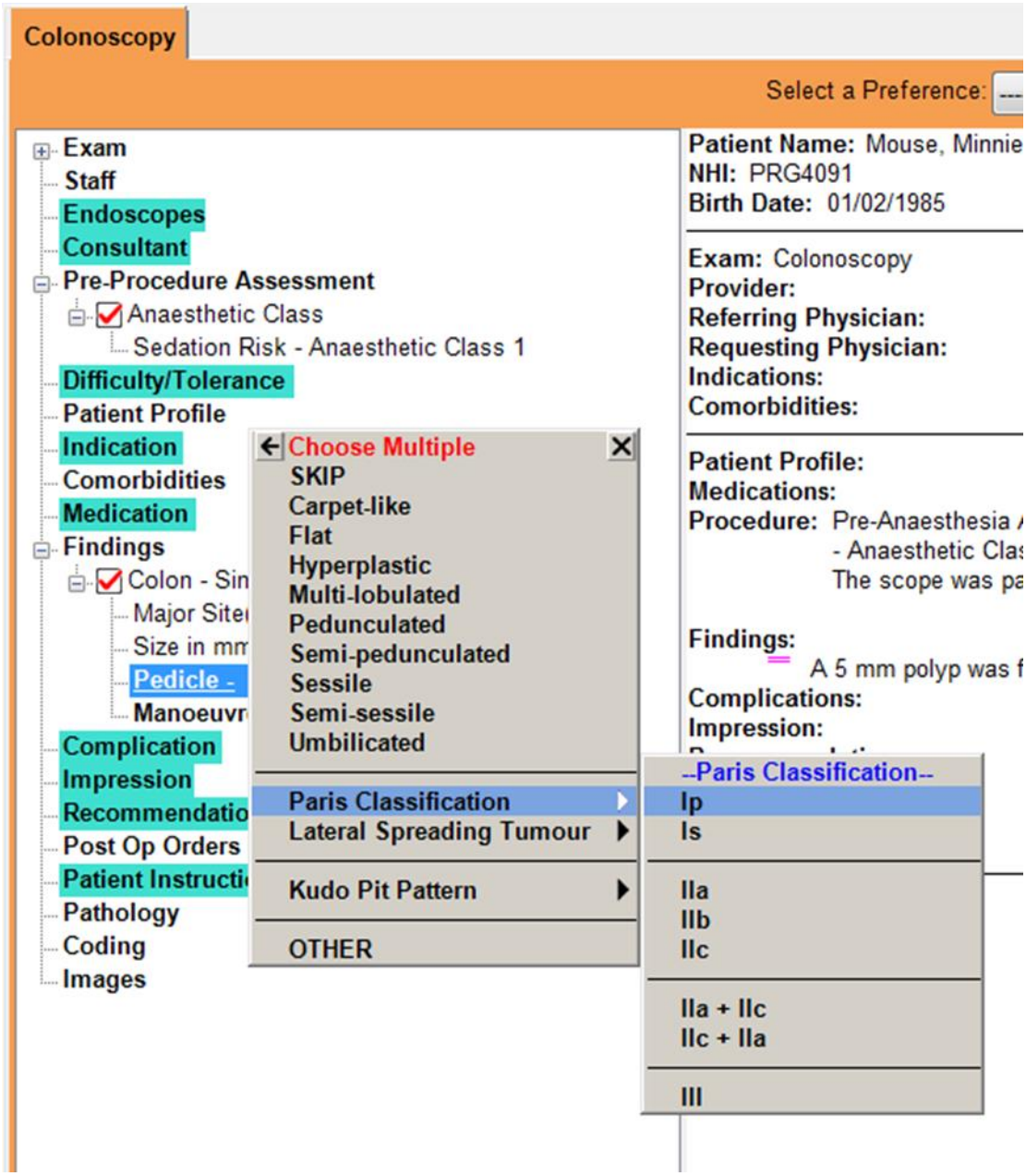
When anaesthetic-assisted sedation is given, or for multiply comorbid individuals then the ASA Class may be more appropriate. This is found under: *Pre-Procedure Assessment.*



Description of polyp morphology using the Paris classification can be completed when indicating that a polyp has been found/ removed under:

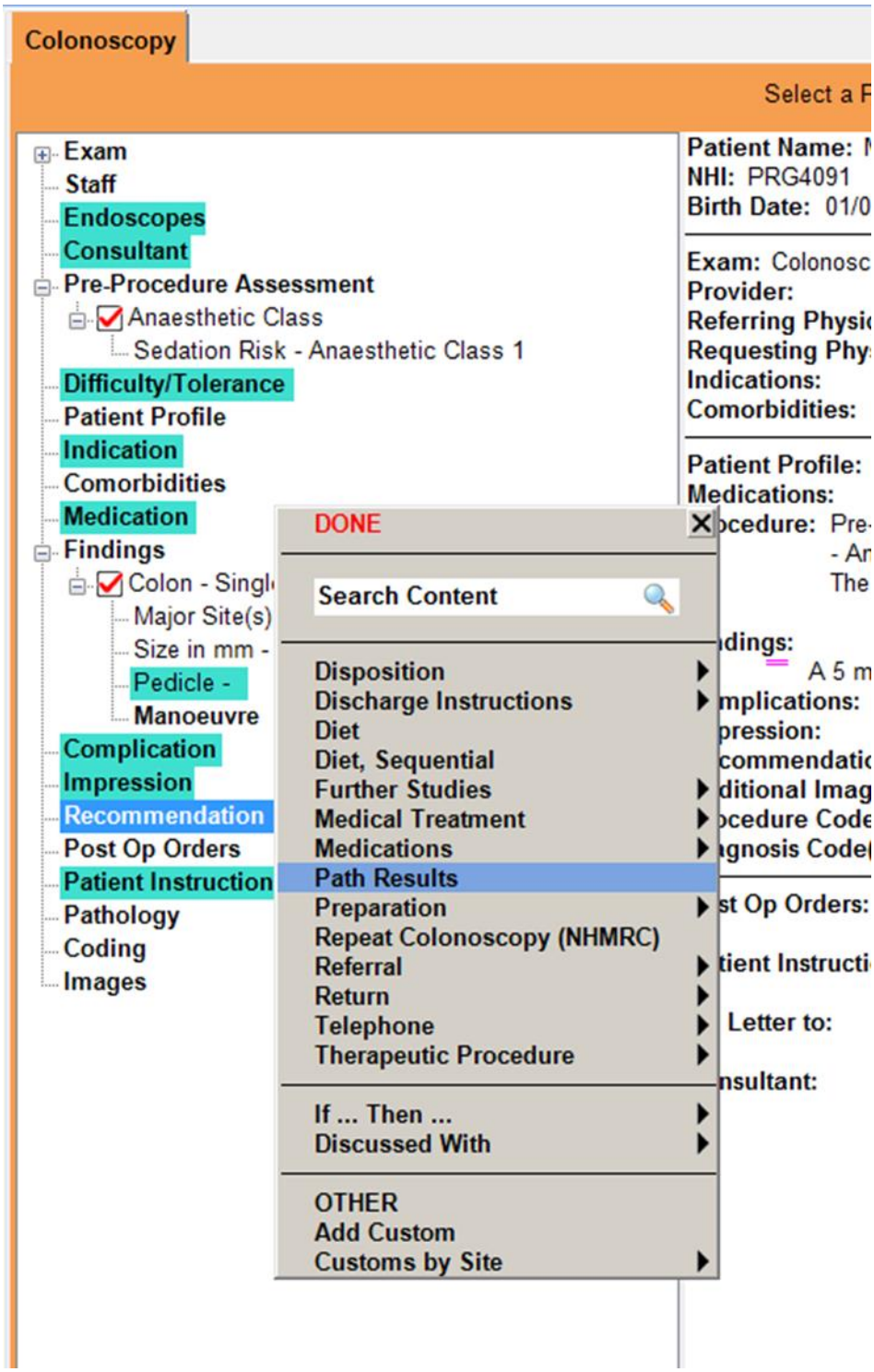
- *Findings-single polyp*
- *Pedicle*
- *Paris Classification.*

There is also the ability to complete the *Kudo Pit Pattern* classification here too.



Post Colonoscopy Recommendation.
Many Screening Units will have a standard proforma loaded in ProVation outlining symptoms to look out for, who to contact if necessary and outlining follow up.

However, if you do not have that then it is preferable that the follow up is left to the local BSP team and NOT decided by the colonoscopist. Therefore, for both *Recommendations* and *Patient Instructions* choose *Path Results.*



Appendix C: Bowel Preparation

The Boston Bowel Preparation Score

The Boston Bowel Preparation Score (BBPS) [27] was developed to limit inter-observer variability in the rating of bowel preparation quality, while preserving the ability to distinguish various degrees of bowel cleanliness.

The score is a total of the points allocated for the adequacy of the mucosal views in the 3 scored segments of the right colon, the transverse colon and the left colon. The score is taken on withdrawal after manoeuvres to improve the view such as washing and rolling the patient have been undertaken.

Table 3 outlines the details of each point on the scale. The maximum BBPS score for a perfectly clean colon without any residual liquid is 9 and the minimum BBPS score for an unprepared colon is 0.
If an endoscopist aborts a procedure due to an inadequate preparation, then any non-visualized proximal segments are assigned a score of 0.

BPPS Score	Descriptor
0	Unprepared colon segment with mucosa not seen due to solid stool that cannot be cleared.
1	Portion of mucosa of the colon segment seen, but other areas of the colon segment not well seen due to staining, residual stool and/or opaque liquid.
2	Minor amount of residual staining, small fragments of stool and/or opaque liquid, but mucosa of colon segment seen well.
3	Entire mucosa of colon segment seen well with no residual staining, small fragments of stool or opaque liquid.

Guidance on Bowel Preparation.

The ideal bowel preparation should be safe, effective and well-tolerated but a single preparation type and dosing regimen will not suit all patients. Preparation timing is important for efficacy and dietary preparation has implications for satisfaction and tolerance.

Pre-procedure diet

Several low residue diets are as effective as a clear fluid restriction prior to colonoscopy with significantly increased patient satisfaction and tolerability [28]. Low residue diets such as the 'white diet' (Table 1) can be used on the day(s) prior to colonoscopy in a split-dose preparation regimen without impairing the quality of the preparation, while achieving significant improvements in patient satisfaction and tolerability [29] .This is also likely to be effective with same day preparation.

Table 1: Food and Fluids permitted in the white diet and those not allowed [29]**.**

Foods & fluids permitted	Milk (regular, low fat, skim), water, lemonade, soda or mineral water, clear (not coloured) sports drinks White-coloured yoghurt (no added fruit or inulin), mayonnaise, cream, sour cream, butter and margarine, oil for cooking Regular white bread/toast, popped rice cereal (e.g. Rice Bubbles), eggs White rice, regular pasta, potatoes (peeled), rice noodles Plain rice crackers, white flour, sugar Chicken breast (no skin), white fish fillet (no skin) Plain cream cheese, cheddar cheese, ricotta, fetta, cottage, parmesan or mozzarella cheese, white sauce, white chocolate, vanilla ice cream, lemonade ice-block (e.g. 'Icy-pole'), clear jelly, custard, 'milk bottles' (white confectionery)
Foods not allowed	Anything not listed above Other white-coloured foods such as pears, parsnip, cauliflower, onion, high fibre white bread, tofu, coconut, porridge, banana, mushrooms, semolina, couscous, popcorn

Available Bowel Preparations

Main ingredient	**Action**	**Main types**	**Volume (without clear fluids)**	**Pro**	**Con**
PEG *e.g. Glycoprep C, MoviPrep, Plenvu, Klean-Prep*	Osmotic	PEG PEG + ascorbate components PEG + ascorbate components	1000mL x 3 1000mL x2*# 500mL x 2*#	Safe and effective Modest fluid/electrolyte shift when consumed as per recommendations First choice for patients with: renal failure, heart failure, cirrhosis, IBD, older age	Larger volumes may be less well tolerated

Main ingredient	Action	Main types	Volume (without clear fluids)	Pro	Con
Sodium picosulphate, magnesium oxide, citric acid *e.g. Picosalax, PicoPrep*	Stimulant and osmotic	Sodium picosulphate + magnesium oxide and citric acid	250mL x 2*‡	Lower volume	Generally well tolerated Beware in renal impairment (transient hyper-magnesaemia) Beware dehydration (consider PEG-based preparation in elderly/comorbidities) Risk of dehydration and acute kidney injury Risk of phosphate nephropathy and irreversible renal failure
Sodium phosphate *e.g. Fleet*	Hyperosmotic	Sodium phosphate liquid§ Sodium phosphate tablets§	45mL x 2 32 tablets	Low volume or tablet form	Avoid in: • Elderly • heart failure • renal impairment • cirrhosis • IBD • patients on medications that alter renal blood flow/electrolytes

*Abbreviations: PEG: Polyethylene glycol; IBD: inflammatory bowel disease; *recommended additional minimum of 500mL clear fluids per dose; §750mL minimum additional clear fluid recommended per dose; #recommend avoiding in G6PG deficiency; ‡recommend avoiding in phenylketonuria.*

***Note:** This table may not list all commercially available bowel preparations. Some companies create combination kits containing more than one form of bowel preparation*.

Timing of Preparation.

The timing of bowel preparation is one of the most important factors associated with optimal bowel preparation.

Split-dose bowel preparation is associated with a significantly increased chance of successful bowel preparation when compared with traditional 'day-prior' preparation. In a meta-analysis, success with spit-dose preparation compared with day-prior preparation was 85% versus 63% (absolute difference 22%; confidence interval [CI] 16–27%) [30].

Timing of the last dose prior to the procedure is also important [30], [31]. In the meta-analysis by Bucci et al [30], there was a significantly greater chance of preparation success when the last dose was taken between 3 and 5 hours prior to the colonoscopy. This is also safe from an anaesthetic/sedation viewpoint [32].

Same day bowel preparation is when the entire preparation is taken on the same day as the colonoscopy. In a meta-analysis, this had a similar efficacy and patient tolerance to a split-dose preparation.

Factors associated with poor preparation

Factors associated with an increased risk of poor bowel preparation include reduced health literacy, older age, constipation, chronic disease, diabetes, cirrhosis, neurological conditions such as stroke and dementia, immobility, spinal injury, prior gastrointestinal surgery, opioids and antidepressant medication and previous failed colonoscopy due to poor prep.

Providing larger volumes of bowel preparation in a split dose should be considered for patients at significant risk of poor preparation or those with a history of inadequate bowel preparation. In a study of patients with a prior poor bowel preparation, success rate was higher among those randomised to 4L split-dosed PEG than those randomised to 2L split-dosed PEG: 81.1% versus 67.4% odds ratio [OR] 2.07; CI: (1.163–3.689) [33]. Validated scoring systems such as the one by Gimeno-Garcia et al [30] may help in identifying those at risk of poor preparation, but a corresponding management algorithm is awaited.

Admission for bowel prep can be considered, especially for those with mobility and care-related issues.

Appendix D: Recommended techniques for a quality colonoscopy

Introduction

The aim of NBSP colonoscopy is to detect colorectal cancer (CRC) early and remove premalignant lesions to reduce future risk of developing CRC. The post-colonoscopy colorectal cancer rate (PCCR) is therefore, logically, considered to be the most robust of Key Performance Indicators [35]. Analysis of PCCRs have suggested that up to 89% are preventable, mainly due to missed lesions at the index procedure [36].

The Adenoma Detection Rate (ADR) is a more immediately calculable KPI and, despite limitations, has shown some robustness in relation to outcomes, including PCCR. In a seminal work it has been shown that an increase in ADR of 1% results in a decrease in CRC risk by 3% [37]. High-quality colonoscopy is dependent on patient, operator, system–related factors and equipment.

Appropriate standard of equipment and systems are addressed in the EGGNZ-MoH Endoscopy Unit Service and Facility Standards for New Zealand [12]. Experience and performance standards for colonoscopists starting and performing NBSP procedures are stated in sections 3 and 6 of this document.

All colonoscopists are trained to maximise the mucosal views with washing and close inspection around folds. This section summarises additional techniques and technologies that will maximise the quality of a colonoscopy, with special relation to ADR.

Procedural Technique

Rectal examination

The rectum is a recognised location for missed pathology, including cancers. Initial analysis of post colonoscopy CRC in the bowel screening pilot study (led by Dr Paul Frankish, Endoscopy Lead, National Bowel Screening Pilot Programme, Waitemata DHB) has identified the rectum to be the site for approximately 20% of PCCRC presenting within 5 years of initial NBSP procedure.

A rectal examination should be undertaken, along with inspection of the perineum, with result documented. Once the scope is inserted and the residual rectal fluid cleared this can often be a good time to perform retroflexion; which should be confirmed with photographic documentation.

Insertion Techniques

Water and CO_2 insufflation.

CO_2 should be universally used as the gas of choice. It leads to a more comfortable procedure for the patient, reduces recovery time compared to using air and is safe in non-oxygen dependent COPD patients [38], [39].

However, it does not appear to improve adenoma detection rates (ADR). Water exchange is the technique of filling the colon with clean water during instrument insertion, while simultaneously removing dirty water. Again, need for sedation, abdominal pressure and mean and maximum pain scores are less than with gas insufflation [40]. Meta-analysis has also suggested that water exchange might be the best, and most cost effective, way of improving ADR [41]. An infusion volume of at least 500mL appears necessary [42]. Water exchange does, however, slightly increase the procedure time by prolonging the insertion time to caecum by an average of 2 minutes.

Withdrawal Time (WT)

Although pathology is not infrequently encountered during insertion, it is the period of slow and careful withdrawal when the vast majority is discovered and dealt with. There is a direct correlation between speed of withdrawal and detection of neoplasia. In the landmark study Barkley et al demonstrated that a mean non-interventional withdrawal time of > 6 minutes vs. < 6 minutes resulted in significantly more detection of all neoplasms (28.3% vs 11.8% ($p<0.001$) and advanced neoplasms 6.4% vs 2.6% (p 0.005) [43].

In the UK BSP study of over 31,000 colonoscopies a WT of 9 minutes resulted in an increase of 25% in the total numbers of adenomas removed compared to WT < 6 minutes, and for WT of 11 minutes 50% more right sided adenomas were found [44].

Recognising 'Blind Spots'

A number of historical studies have consistently shown that colonoscopy demonstrates lower levels of protection against right-sided (proximal to the splenic flexure) cancers. There are a number of recognised 'blind spots', and techniques which should be used to minimise the chance of missing pathology.

- Caecum, between appendiceal orifice and ileo-caecal valve; in the left lateral position, ileal effluent pools here, so rolling the patient supine, or even on to the right side will clear this area and allow inflation to expand this zone.
- Ascending colon; the right colon has a preponderance for Sessile Serrated lesions, with their associated more aggressive natural history (FER). 'Second look' or inspection in forward and retroflexed views improve ADR equally 10% v 6%, NSD [45].
- Splenic and Hepatic flexures; rolling patients such that the flexures are expanded improves views. "Dynamic positioning" (from left lateral for right colon, supine for transverse and right lateral for left colon) has been shown to increase the ADR by 11.8% when compared to withdrawal with the patient totally in the left lateral position [46].
- Standard photo-documentation of the 'blind spots' also encourages closer inspection [47].
- Retroflexion and photo-documentation in the rectum should also be routine (see above).

Use of Hyoscine butylbromide (Buscopan)
Routine use of hyoscine butylbromide (Buscopan) has not been shown to increase ADR as a single intervention [48].
However, a cost-effective and relatively simple 'bundle' of;

- minimal caecal withdrawal time of ≥ 6 minutes
- hyoscine butylbromide use
- supine patient position for transverse colon examination
- rectal retroflexion

has been shown to improve colonoscopy quality as measured by ADR, particularly in poorer performers, in a multicentre UK study over 3 years [49].

Magnetic Image Positioning
Colonoscopy insertion can result in discomfort caused by bowing and manipulation of the bowel by the colonoscope. This can be minimised by using a magnetic position imaging device (such as the Scope Guide) that demonstrates the shape that the scope forms as it is inserted. A recent large meta-analysis found that this resulted in reduced time to caecum (even in expert hands), increased caecal intubation rate and reduced pain scores [50]. In NBSP procedures it can be especially useful in indicating the location of pathology.

Adjunct technologies available to improve polyp detection.
Distal attachment devices
Distal tip devices improve adenoma detection rate by around 11% for low-performing endoscopists and by 45% for high-performing endoscopists [51]. There is more evidence for the EndoCuff device, with an Odds Ratio for increase in all polyp detection rate of 1.56 [52]. The distal cap does appear to increase right sided ADR [53] and may be beneficial for terminal ileal intubation, pit pattern analysis and in larger Endoscopic Mucosal Resection.

Electronic / Virtual Chromoendoscopy (VC).
Although in systematic review the use of VC does not decrease the adenoma miss rate [54], the technique is equal to the use of chemical chromoendoscopy in aiding description of polyp pit pattern [55], which is now recognised as fundamental in decision making in polypectomy.

Polypectomy

Measurement of polyp size.
Polyp size is proportional to cancer risk [56] and is part of the Size, Morphology, Site and Access (SMSA) method of determining difficulty of polyp removal (see below). Colonoscopists should be familiar with the sizes of snares available and use the maximum ***width*** of the open snare to determine size.

Morphology and Pit Pattern of polyps.
The macroscopic shape of a polyp, along with the regularity of villous pits and microvasculature, can indicate the likelihood of submucosal invasion, and therefore the likelihood of being able to provide a curative endoscopic resection. Colonoscopists must therefore be aware of what constitutes a high risk or worrying lesion.

The most common descriptor is the Paris classification [57]. It is also important to recognise what constitutes a granular and non-granular lateral spreading lesion and the high grade of NICE, JNET or Kudo pit patterns.

All these criteria are well described in the recent recommendations by the US Multi-society Task Force on Colorectal Cancer [23].

A decision tool for polypectomy.
On deciding whether to attempt to endoscopically remove larger polyps endoscopically the degree of difficulty can be objectively assessed by considering a combination of SMSA) criteria of the lesion as described by the St Mark's group [58]. Points can be assigned and degree of difficulty 1-4 allows decision about appropriate removal dependent on skill level. For example, Polypectomy performed on a 2 cm flat lesion behind a fold in the ascending colon requires a different set of skills compared to those required for a 1 cm pedunculated polyp in the left colon with easy access. The SMSA score reflects these scenarios as being difficult (13 points, level IV) vs. easy (6 points, level I).
The scoring system is illustrated in table 1, with the range of scores correlated to the polyp difficulty level in table 2.

Note that NBSP colonoscopists should have at least the technical skills to deal with Level 3 polypectomy because of the high frequency with which these types of polyps will be encountered (see section 1.3a).

Scoring system to determine difficulty of polypectomy [58]**.**

Parameter	Range	Score
Size	<1cm	1
	1-1.9 cm	3
	2-2.9 cm	5
	3-3.9 cm	7
	>4 cm	9
Morphology	Pedunculated	1
	Sessile	2
	Flat	3
Site	Left	1
	Right	2
Access	Easy	1
	Difficult	3

Range of SMSA scores for each polyp level.

Polyp Level	Range of Scores
Level I	4-5
Level II	6-8
Level III	9-12
Level IV	>12

Polypectomy Techniques.
Polypectomy techniques are advancing year on year and it is beholden on NBSP colonoscopists to keep up with the latest practices. The current best practices in polypectomy are described in the recent recommendations by the US Multi-society Task Force on Colorectal Cancer [23]. These are deemed relevant to practice in New Zealand and endorsed by EGGNZ. A useful recent website webinar, specifically targeted to NBSP provided by St Marks, is available at: https://www.nsu.govt.nz/health-professionals/tools-and-resources/webinar-colonoscopists-performing-polypectomy.

Appendix E: Performance standards for colonoscopies undertaken for NBSP.

Standard 7.
Aspirational:

2. Polyps will be described by the PARIS classification.
3. Polyp pit pattern will be described using Kudo or NICE classification in all worrying lesions or those >15mm.

Table 1.
Polyp morphology according to Paris Classification related to size and risk of submucosal Invasion.

			Polyp Size		
Lesion type	**≤5mm**	**6-10mm**	**11-15mm**	**16-20mm**	**≥21mm**
Type Ip-Is	0%	1.2%	8%	17%	30%
Type IIa + IIb	<0.1%	0.2%	1.8%	10%	23%
Type IIc	7%	44%	67%	90%	87%
Total	19/11850 (<0.2%)	109/5091 (2%)	131/1558 (8%)	93/1523 (18%)	122/437 (28%)

Rewritten from Paris Workshop 2003 [53], showing % of submucosal invasion with reference to the major macroscopic categories Type 0, and diameter of lesion in a total of 19560 lesions [59].

Table 2.
Pit pattern by Kudo classification and histology of lesions [60].

	Adenoma	**Dysplasia**		
Pit pattern	**Low Grade**	**High Grade**	**Cancer**	**Total**
III	2714 (**83.3%**)	546 (**16.7%**)	0	3260
IV	44 (**51.1%**)	364 (**46.5%**)	19	783
IIIs	29 (**55.5%**)	22 (**42.3%**)	1	52
Vi	35	165 (**59.1%**)	79 (**28.3%**)	279
Vn	0	8 (**9.9%**)	73 (**90.1%**)	81
Total	3178	1105	172	4455

Table 3.
Pit pattern by NICE classification and deep invasion of lesions.

NICE Classification			**Submucosal Invasion**
I & II	Depressed area		93 (**9.7%**)
	No depressed area	LST-G mixed nodular	93 (**8.6%**)
		LST-G non-nodular	1812 (**1.0%**)
III	Pedunculated		31 (**13%**)
	Non-pedunculated	Ulcerated	80 (**44.0%**)
		Non-ulcerated	14 (**93.0%**)

Results of a prospective of 1634 consecutive colonoscopies performed by 58 endoscopists in Spain, characterising all lesions >10mm using Narrow Band Imaging [61].
LST-G = Lateral Spreading Tumour – Granular type.

Table 4.
Summary of polyp features that indicate higher risk of malignant invasion,

- Kudo type V pit pattern (irregular or loss of pit pattern)
- Paris 0-IIc or 0-IIa+c morphology (depressed component)
- Non-granular-type laterally spreading polyp (LST-NG 'flat or smooth')
- Granular-type LST (G-LST) with a dominant nodule (≥10 mm in size)
- Distorted surface pattern, colour and vessels (narrow band imaging international colorectal endoscopic classification type III)

(adapted from [62]).

Glossary of Terms

Credentialing	The process of review and verification of fitness to practice typically performed by an organisation to grant specific clinical privileges such as performing procedures at that institution.
Certification	The action or process of providing someone with an official document attesting to a status or level of achievement. For EGGNZ this would attest to a level of competence in an endoscopic procedure.
Accreditation	The process of officially recognizing a person or body as being qualified to perform a particular activity. In the context of endoscopy, this would be recognizing a unit as being up to a particular standard to perform endoscopy.
Perforation	Traumatic disruption of all of the layers of the bowel wall.
Withdrawal Time	This is measured from the time the colonoscopist starts viewing the colon having reached the caecum and started withdrawing the colonoscope,
Caecal Intubation	Defined as passage of the colonoscope proximal to the ileo-caecal valve with visualisation of the appendiceal orifice, triradiate caecal fold or retroflexed view of ileocaecal valve. Verification is preferably by photograph of these, with the addition of the terminal ileum if intubation is achieved.
Caecal Intubation Rate (unadjusted)	The % of reaching the caecum including all colonoscopies even if they are not completed due to difficult anatomy, poor bowel prep or non-traversable stenotic lesions.
Adjusted Caecal Intubation Rate	Only colonoscopies without obstructing lesions or poor bowel preparation preventing caecal intubation are counted.
Serious Adverse Events	Any event resulting in: unplanned hospitalisation for 4 or more nights; admission to Intensive Care; requiring an interventional procedure; ventilatory support during conscious sedation for procedure; surgery; permanent disability or death [8]
Endoscopic Time Out	The multi-disciplinary Endoscopy safety checklist performed before each procedure [63]
Non-interventional colonoscopy	A colonoscopy where no biopsy, polypectomy or other therapeutic manoeuvre is undertaken.
Dynamic positioning	Pro-active rolling of patient between left lateral, supine and right lateral positions to maximise mucosal views.

Abbreviations

BCS	Bowel Cancer Screening
NBSP	National Bowel Screening Programme (NZ)
CME-E	Continuing Endoscopic Medical Education
CQI	Continuous Quality Improvement
DOPS	Direct Observation Procedural Skills
EGGNZ	Endoscopy Guidance Group for New Zealand
FIT	Faecal Immunochemical Test
FOBT	Faecal Occult Blood Test
FS	Flexible Sigmoidoscopy

GESA	Gastroenterological Society of Australia
KPI	Key Performance Indicators
NEQIP	National Endoscopy Quality Improvement Programme
NZGRS	New Zealand Global Rating Scale
NZNO	New Zealand Nurses Organisation
NZSG	New Zealand Society of Gastroenterology
RACP	Royal Australasian College of Physicians
RACS	Royal Australasian College of Surgeons

References

[1] Waitangi Tribunal, “Hauroa: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry.,” Waitangi Tribunal, Wellington, 2019.

[2] Te Kaunihera Rata o Aotearoa, Medical Council of New Zealand, “Statement on cultural safety,” [Online]. Available: www.mcnz.org.nz. [Accessed 2021].

[3] Ministry of Health, “NZS 8134:2021. New Zealand Standard, Nga Paerewa Health and Disability Service Standard. Superseeding NZS 8134:2008, NZS 8181:2007 and NZS8158:2012,” [Online]. Available: https://hdc.org.nz/your-rights/about-the-code-of-health-and-disability-services-consumers-rights/. [Accessed August 2021].

[4] Health and Disability Commissioner , “Code of Health and Disability Services Consumers' Rights Regulations,” 1996. [Online]. Available: https://hdc.org.nz/your-rights/about-the-code-of-health-and-disability-services-consumers-rights/. [Accessed August 2021].

[5] National Endoscopy Quality Improvement Programme, “New Zealand Global Rating Scale (NZGRS),” [Online]. Available: https://nz.jagaccreditation.org/. [Accessed 2021].

[6] The Endoscopy Guidance Group for New Zealand (EGGNZ), “Guidelines for Local Credentialing in Adult Endoscopy,” 2021. [Online]. Available: https://eggnz.endoscopyquality.co.nz/assets/Uploads/Guidelines-for-local-credentialing-V2.pdf. [Accessed October 2021].

[7] Gastroenterological Society of Australia (GESA), “National Safety and Quality Health Service Standards - Certification and Recertification of practising adult colonoscopists.,” 2019. [Online]. Available: https://www.safetyandquality.gov.au/standards/clinical-care-standards/colonoscopy-clinical-care-standard/clinicians-colonoscopy-clinical-care-standard. [Accessed 24 November 2020].

[8] Rees C, Thomas-Gibson S, et al, “UK Key Performance Indicators & Quality Assurance Standards for Colonoscopy,” UK, 2016.

[9] ANZ Conjoint Committee, “DOPS Endoscopy Form,” [Online]. Available: https://nzsg.org.nz/assets/Uploads/ANZ-Conjoint-DOPS-V1-Colonoscopy-form.pdf. [Accessed 9 February 2021].

[10] JAG UK, “Formative DOPyS: Colonoscopy and Flexible Sigmoidoscopy,” 2016. [Online]. Available: https://www.thejag.org.uk/Downloads/JAG/DOPS%20forms%20(international%20and%20reference%20use%20only)/Formative%20DOPyS_Colonoscopy%20and%20Flexible%20sigmoidoscopy.pdf. [Accessed 21 January 2021].

[11] Australian and New Zealand College of Anaesthetists, “Safe procedural sedation competencies,” 2019. [Online]. Available: https://nzsg.org.nz/assets/Uploads/safe-procedural-sedation-competencies-v1.0.pdf. [Accessed 21 January 2021].

[12] The Endscopy Guidance Group for New Zealand (EGGNZ), "EGGNZ_MoH Endoscopy Unit Service and Facility Standards for New Zealand," 2020. [Online]. Available: https://endoscopyquality.co.nz/assets/Uploads/EGGNZ-MoH-Endoscopy-Unit-Service-and-Facility-Standards-for-New-Zealand-2020-v5-FINAL3.pdf. [Accessed 15 December 2020].

[13] Australian and New Zealand College of Anaesthetics, "PS09: Guidelines on Sedation and/or Analgesia for Diagnostic and Interventional Medical, Dental or Surgical Procedures.," Melbourne, 2014.

[14] Froehlich F, Wietlisbach V, Gonvers JJ, Vader JP, "Impact of colonic cleansing on quality and diagnostic yield of colonoscopy: the European Panel of Appropriateness of Gastrointestinal Endoscopy European multicenter study," *Gastrointestinal Endoscopy,* vol. 61, no. 3, pp. 378-84, March 2005.

[15] Harewood GC, Sharma VK, de Garmo P, "Impact of colonoscopy preparation quality on detection of suspected colonic neoplasia," *Gastrointestinal Endoscopy,* vol. 58, no. 1, pp. 76-9, July 2003.

[16] Parra-Blanco A, Nicola-Perez D, Gimeno-Garcia A, Grosso B, Jimenez A, Ortega J, et al, "The timing of bowel preparation before colonscopy determines the quality of cleansing, and is a significant factor contributing to the detection of flat lesions: a randomized study.," *World Journal of Gastroenterology,* vol. 12, no. 38, pp. 6161-6, Oct 2006.

[17] Rex DK, Imperiale TF, Latinovich DR, Bratcher LL., "Impact of bowel preparation on efficiency and cost of colonoscopy," *American Journal of Gastroenterology,* vol. 97, no. 7, pp. 1696-700, July 2002.

[18] Cohen LB, "Advances in bowel preparation for colonscopy," *Gastrointestinal Endoscopy Clinics of North America,* vol. 25, no. 2, pp. 183-97, April 2015.

[19] Sulz MC, Kroger A, Prakash M, Manser CN, Heinrich H, Misselwitz B, "Meta-Analysis of the Effect of Bowel Preparation on Adenoma Detection: Early Adenomas Affected Stronger than Advanced Adenomas," *PLos One,* vol. 11, no. 6, 2016.

[20] Cancer Council Australia, "Clincal practice guidelines for surveillance colonoscopy," [Online]. Available: https://wiki.cancer.org.au/australia/Guidelines:Colorectal_cancer/Colonoscopy_surveillance. [Accessed 25 November 2020].

[21] Rostom A, Jolicoeur E, "Validation of a new scale for the assessment of bowel preparation quality," *Gastrointestinal Endoscopy,* vol. 60, no. 2, p. 326, August 2004.

[22] Te Aho o Te Kahu, "Update on Polyp Surveillance Guidelines," 2020. [Online]. Available: https://www.health.govt.nz/publication/update-polyp-surveillance-guidelines-2020. [Accessed 15 December 2020].

[23] Kaltenbach T, et al, "Endoscopic Removal of Colorectal Lesions – Recommendations by the US Multi-Society Task Force on Colorectal Cancer.," *Gastroenterology,* vol. 158, no. 4, pp. 1095-112, 2020.

[24] British Columbia Cancer Agency, “Colon screening program colonoscopy standards,” Vancouver B.C., 2018.

[25] National Cancer Screening Service, “Guidelines for Quality Assurance in Colorectal Screening,” Dublin, Ireland, 2017.

[26] National Screening Programme for Bowel Cancer, “Protocol for the authorization and auditing of colonoscopy centres and endoscopists.,” National Institute for Public HEalth and the Environment, Netherlands, 2012.

[27] Lai E, et al, “The Boston bowel preparation scale: a valid and reliable instrument for colonoscopy-oriented research,” *Gastrointestinal Endoscopy,* vol. 69, no. 3pt 2, pp. 620-625, 2009.

[28] Nguyen DL, Jamal MM, Nguyen ET, Puli SR, Bechtold ML, “Low-residue versus clear liquid diet before colonscopy: a meta-analysis of randomized, controlled trials.,” *Gastronintestinal Endoscopy,* vol. 83, no. 3, pp. 499-507, March 2016.

[29] Butt J, Bunn C, Paul E, Gibson P, Brown G, “the White Diet is preferred, better tolerated, and non inferior to a clear-fluid diet for bowel preparation,” *Journal of Gastroenterology and Hepatology,* vol. 31, no. 2, pp. 355-63, Feb 2016.

[30] Bucci, C, Rotondano G, Hassan C, Rea M, Bianco MA et al, “Optimal bowel cleansing for colonoscopy: split the dose! A series of meta-analyses of controlled studies,” *Gastrointestinal Endoscopy,* vol. 80, no. 4, pp. 566-576, Oct 2014.

[31] Siddiqui AA, Yang K, Spechler SJ, Cryer B, Davila R, Cipher D et al, “Duration of the interval between the completion of bowel preparation and the start of colonscopy predicts bowel-preparation quality,” *Gastrointestinal Endoscopy,* vol. 69, no. 3 Pt 2, pp. 700-6, March 2009.

[32] Avalos DJ, Michael M, Castro-Pavia F, Sussmann D, Gonzalez Martinez JL, Dwivedi A et al., “Split-Dose Bowel Preparation Does Not Increase Gastric Residual Volume as Compared With Day Prior Preparations: A Systematic Review and Network Meta-Analysis.,” *GIE,* vol. 85, no. 5, 2017.

[33] Gimeno-Garcia A, Hernandez G, Aldea A, Nicolas-Perez D et al, “Comparison of Two Intensive Bowel Cleansing Regimens in Patients With Previous Poor Bowel Preparation: A Randomized Controlled Study,” *The American Journal of Gastroenterology,* vol. 112, no. 6, pp. 951-958, 2017.

[34] Gimeno-Garcia AZ, et al., “Risk factors for inadequate bowel preparation: a validated predictive scrore.,” *Endoscopy,* vol. 49, no. 6, pp. 536-543, 2017.

[35] Rutter MD, et al, “World Endoscopy Organisation consensus statements on post-colonoscopy and post-imaging colorectal cancer.,” *Gastroenterology,* vol. 155, pp. 909-925, 2018.

[36] Anderson R, “Causes of Post-Conoloscopy Colorectal Cancers Based on World Endoscopy Organization System of Analysis,” *Gastroenterology,* vol. 158, no. 5, pp. 1287-1299, 2020.

[37] Corley D, "Adenoma Detection Rate and Risk of Colorectal Cancer and Death," *The New England Journal of Medicine,* vol. 370, no. 14, p. 1298, 2014.

[38] Sajid MS, et al, "Carbon dioxide insufflation vs conventional air insufflation for colonoscopy: a systematic review and meta-analysis of published randomized controlled trials," *Colorectal Disease,* vol. 17, no. 2, pp. 111-23, 2015.

[39] Yoshida M, et al, "Carbon dioxide insufflation during colorectal endoscopic submucosal dissection for patients with obstructive ventilatory disturbance," *International Journal of Colorectal Disease,* vol. 29, no. 3, pp. 365-71, 2014.

[40] Jun W, "Comparative effectiveness of water infusion vs air insufflation in colonoscopy: a meta-analysis," *Colorectal Disease,* vol. 15, no. 4, pp. 404-9, 2013.

[41] Shao P, Bui A, Romero T, et al, "Adenoma and Advanced Adenoma Detection Rates of Water Exchange, Endocuff, and Cap Colonoscopy: A Network Meta-Analysis with Pooled Data of Randomized Controlled Trials," *Digestive Diseases and Sciences,* p. Online ahead of print, 2020.

[42] Cadoni S, Falt P, Rondonotti E, Radaelli F, et al, "Water exchange for screening colonoscopy increases adenoma detection rate: a multicenter, double-blinded, randomized controlled trial.," *Endoscopy,* vol. 49, no. 5, pp. 456-467, 2017.

[43] Barclay R, et al, "Colonscopic Withdrawl Times and Adenoma Detection during Screening Colonoscopy," *New England Journal of Medicine,* vol. 355, p. 2533, 2006.

[44] Lee TJ, et al, "Longer mean colonoscopy withdrawl time is associated with increased adenoma detection: evidence from the Bowel Cancer Screening Programme in England.," *Endoscopy,* vol. 45, pp. 20-26, 2013.

[45] Desai M, et al, "Increasing adenoma detection rates in the right side of the colon comparing retroflexion with a second forward view: a systematic review," *Gastrointestinal Endoscopy,* vol. 89, no. 3, pp. 453-459, 2019.

[46] Can J, "A simple method to improve adenoma detection rate during colonoscopy: Altering patient position," *Canadian Journal of Gastroenterology,* vol. 27, no. 9, pp. 509-512, 2013.

[47] Rey J, et al, "ESGE Recommendations for Quality Control in Gastrointestinal Endoscopy," *Endoscopy,* vol. 33, no. 10, pp. 901-90, 2001.

[48] Madhoun M, et al, "Effect of hyoscine N-butylbromide on adenoma detection rate: meta-analysis of randomized clinical trials," *Digestive Endoscopy,* vol. 27, no. 3, pp. 354-61, 2015.

[49] Neilson L, et al, "Sustained colonoscopy quality improvement using a simple intervention bundle.," *Endoscopy,* vol. 52, no. 4, pp. 285-292, 2020.

[50] Mark-Christensen A, et al, "Magnetic endoscopic imaging as an adjuvant to elective colonoscopy: a systematic review and meta-analysis of randomized controlled trials," *Endoscopy,* vol. 47, no. 3, pp. 251-61, 2015.

[51] Facciorusso A, et al, “Comparative Efficacy of Colonoscope Distal Attachment Devices in Increasing Rates of Adenoma Detection: A Network Meta-analysis,” *Journal of Gastroenterology and Hepatology,* vol. 16, no. 8, pp. 1209-1219, 2018.

[52] Castaneda D, et al, “New technologies improve adenoma detection rate, adenoma miss rate, and polyp detection rate: a systematic review and meta-analysis,” *Gastrointestinal Endoscopy,* vol. 88, no. 2, pp. 209-222, 2018.

[53] Desai M, et al, “Impact of cap-assisted colonoscopy on detection of proximal colon adenomas: systematic review and meta-analysis,” *Gastrointestinal Endoscopy,* vol. 86, no. 2, pp. 274-281, 2017.

[54] Desai M, et al, “Impact of Electronic Chromoendoscopy on Adenoma Miss Rates During Colonoscopy: A Systematic Review and Meta-analysis,” *Diseases of the Colon and Rectum,* vol. 22, no. 11, pp. 1124-1134, 2019.

[55] dos Santos CE, et al, “Computerized virtual chromoendoscopy versus indigo carmine chromoendoscopy combined with magnification for diagnosis of small colorectal lesions: a randomized and prospective study.,” *European Journal of Gastroenterology and Hepatology,* vol. 22, no. 11, pp. 1364-71, 2010.

[56] O'Brien MJ, et al, “The National Polyp Study: Patient and polyp characteristics associated with high-grade dysplasia in colorectal adenomas,” *Gastroenterology,* vol. 98, pp. 371-9, 1990.

[57] Participants in the Paris Workshop, “The Paris endoscopic classification of superficial neoplastic lesions: esophagus, stomach, and colon.,” *Gastrointestinal Endoscopy,* vol. 58, no. 6, pp. 53-543, 2003.

[58] Gupta S, et al, “A novel method for determining the difficulty of colonoscopic polypectomy.,” *Frontline Gastroenterology,* vol. 4, pp. 244-248, 2013.

[59] Koyama Y, Kotake K, “Overview of colorectal cancer in Japan: report from the Registry of the Japanese Society for Cancer of the Colon and Rectum,” *Dis Colon Rectum,* Vols. 40 (Suppl,10), pp. S2-9, 1997.

[60] Kashida H, Shin-ei K, “Early colorectal cancer: concept, diagnosis, and management,” *International Journal of Clinical Oncology,* vol. 11, no. 1, pp. 1-8, 2006.

[61] Puig I, et al, “Accuracy of the Narrow-Band Imaging International Colorectal Endoscopic Classification System in Identification of Deep Invasion in Colorectal Polyps,” *Gastroenterology,* vol. 156, no. 1, pp. 75-87, 2019.

[62] Rutter MD, Chattree A, Barbour JA, et al, “British Society of Gastroenterology/Association of Coloproctologists of Great Britain and Ireland guidelines for the management of large non-pedunculated colorectal polyps,” *Gut,* vol. 64, pp. 1847-1873, 2015.

[63] Matharoo M, Thomas-Gibson S, Haycock A, Sevdalis N, “Implementation of an endoscopy safety checklist,” *Frontline Gastroenterol,* vol. 5, pp. 260-265, 2014.

Supporting Documents

Anderson, R, et al. (2020). Causes of Post-Colonoscopy Colorectal Cancers Based on World Endoscopy Organization System of Analysis. UK.

Bowel Cancer Screening Programme. (2017-18). *Public health functions to be exercised by NHS England. Service specification No.26.* UK: Cancer Screening, Early Diagnosis and Skin Cancer Prevention Team Department of Health.

Bowel Screening Programme. (2007). Clinical Standards. Scotland: NHS Quality Improvement Scotland.

Bowel Screening. (2015). Bowel Screening Standards. Scotland: Healthcare Improvement Scotland.

European Commission (2011). European Guidelines for Quality Assurance in Colorectal Cancer Screening and Diagnosis - First Edition.

European guidelines for quality assurance in colorectal cancer screening and diagnosis (2010). 1st Ed. European Union: European Commissioner.

European Society of Gastrointestinal Endoscopy (ESGE) (2017). Colorectal polypectomy and endoscopic mucosal resection (EMR): European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline.

European Society of Gastrointestinal Endoscopy (ESGE) (2018). Performance measures for endoscopy services: a European Society of Gastrointestinal Endoscopy (ESGE) Quality Improvement Initiative.

European Society of Gastrointestinal Endoscopy. (2017, March). Colorectal polypectomy and endoscopic mucosal resection (EMR): Clinical Guideline. Endoscopy, 49(3), 270 - 297.

Gastroenterological Society of Australia. (3rd Edition 2006: Reprinted 2011). Endoscopy: Standards for Endoscopic Facilities and Services. Victoria: Digestive Health Foundation.

Ijspeert, J et al. (2017). Development and validation of the WASP classification system for optical diagnosis of adenomas, hyperplastic polyps and sessile serrated adenomas/polyps. Netherlands.

Joint Advisory Group (JAG) (2015). Accreditation of BCSA Bowel Scope screening endoscopists. BCSA guidelines. UK.

Joint Advisory Group (JAG) (2020). Accreditation of Screening Colonoscopists – Guidelines. UK

Lahiff, C; East, J. (2016). Endoscopic approach to polyp recognition. UK

National Bowel Cancer Screening Programme (2016). Quality Framework. Australian Government, Department of Health.

National Bowel Screening Programme (2017). *Interim Quality Standards.* NZ: Ministry of Health

National Colorectal Screening Programme. (2011). *International Peer Review Panel Report of Quality Assurance Standards.* Dublin: National Cancer Screening Service.
New Zealand Nurses Organisation. (2000, 02 24). NZNO Gastroenterology Nurses Section. Retrieved November 24, 2020, from New Zealand Nurses Organisation: http://www.nzno.org.nz/groups/colleges_sections/colleges/nzno_gastroenterology_nurses_college/nzgns_standards

NHS Cancer Screening Programme (2011). Quality Assurance Guidelines for Colonoscopy. NHS PCSP.

NHS Scotland (2020). Bowel Screening Standards – Scoping report. Healthcare Improvement Scotland.

Rembacken B,et al. (2012). Quality in screening colonoscopy: position statement of the European Society of Gastrointestinal Endoscopy (ESGE). Endoscopy, 44, 957-968.

Saunders, B. “How I Do It” – Removing large or sessile colonic polyps. UK

Standards of New Zealand. (2014). Reprocessing of reusable medical devices in health service organizations. AS/NZS 4187:2014. Australia and New Zealand: Standards of New Zealand

Teramoto, A et al. (2019). Clinical importance of cold polypectomy during the insertion phase in the left side of the colon and rectum: a multicentre randomized controlled trial (PRESECT study). Japan.

Tinmouth, J.,et al. (2013). Guideline for Colonoscopy Quality Assurance in Ontario. Toronto: Cancer Care Ontario.