



Key sampling procedures from the NoPSC Biobank

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Introduction

The Norwegian PSC Research Center (NoPSC) biobank was established during the Fall 2008, and is a shared resource for all projects supported by NoPSC and collaborating centers. Both cross-sectional (once only) and prospective (annually) sample collections are performed.

The NoPSC Biobank is a state-of-the-art biobank, where every sample is traceable throughout the system. Standard operation procedures (SOP's) are established for each material category and each tube in the biobank is linked with a specific version of a SOP. The translated procedures presented here represent a subset of key SOPs of the NoPSC biobank. The intention is for these SOPs to serve as inspiration and a potential model for local SOP establishment at centers throughout the International PSC Study Group (IPSCSG), not to be followed in every detail at any center. Best practice biobanking is a continuous process of improvement and standardization.

For questions or comments please contact:

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Chapter 1 - Registration of biobank parameters

NoPSC biobank uses 2D barcoded tubes (Thermo Scientific Matrix 2D Barcoded Storage Tubes) and an in-house electronic tracking system (Medinsight). Per tube (per aliquote, e.g. 250 μ l serum in a 2D barcoded tube) the following parameters are registered:

- Material category
- Sampling date
- Sampling time
- Date of preparation
- Primary fixation (e.g. EDTA, Formalin)
- Preparation (what SOP has been used, with version update number)
- Name of sampler
- Name of preparator
- Volume (if applicable)
- Remaining volume (after withdrawal)
- Number of freeze/thaw cycles
- Concentration (if applicable)
- Concentration unit (if applicable)
- Quality parameters (e.g. RIN-value)
- Patient/control fasting?
- Contrast (ERCP, see chapter 17)
- Detailed position information; freezer, rack, drawer, place, box number and two-dimensional position within the box. Freezer temperature is logged once each hour.
- Withdrawals are registered in the system, and each tube will have its history listed.
- When deviations occur, it is registered in the system.

Chapter 2 – Blood collection and sample preparation

General blood sampling rules:

- As few operators as possible
- Protective wear must be used
- Use sampling form (see attachment 1)
- Patient name and social security number must be checked
- Patient should be fasting, if possible
- Patient should not be stressed during sampling
- Patient should sit or lay down
- A BD Vacutainer Safety-Lok blood collection set or similar is used
- Blood sampling tubes are always taken in the same order
- The blood samples are carefully inverted 6-8 times
- All samples are handled in room temperature, unless stated otherwise
- Deviations from the standard SOP must be registered

Tubes used for blood collection:

		No of tubes x mL blood
1.	Tube with no additive*	1 x 1,0 mL
2.	SST II Plus Advancer, BD Vacutainer® (Serum)	1 x 8,5 mL
3.	Plus Plastic K2EDTA, BD Vacutainer® (EDTA plasma for protein studies)	1 x 10 mL
4.	Plus Plastic K2EDTA, BD Vacutainer® (EDTA blood for DNA extraction)	1 x 10 mL
5.	BD P100, BD Vacutainer® (BD P100 plasma for protein studies)	1 x 8,5 mL
6.	CTAD tube, BD Vacutainer® (CTAD plasma for cytokine studies)	2 x 4,5 mL
7.	Tube with no additive**	1 x 2 mL
8.	PAXgene™ tube, PreAnalytiX, Qiagen/BD*** (for RNA extraction)	1 x 2,5 mL
	Total blood volume per patient	51,5 mL

* This tube is used to empty the dead volume in the blood sampling system. Fill 1 mL of blood and discard the tube.

** This tube is used to completely remove leftovers in the blood sampling system from the CTAD tube

*** It is important to use a BD Vacutainer Safety-Lok blood collection set or similar (follow the blood collection procedures given by the manufacturer).

Sample preparation

Serum protocol, v02:

- Store tubes protected from light until centrifugation
- Coagulate the sample for minimum 30 minutes at room temperature.
- Centrifuge for 10 minutes at 1800 x g in a swing out centrifuge (NB: must be centrifuged within 1.5 hour after sampling)
- Transfer the serum to approx. 15 (Matrix) tubes, 250 μ L per aliquot
- Scan/register the tubes in the tracking solution/database
- Freeze the tubes at -80 °C

EDTA plasma proteomics protocol, v02:

- Within 30 minutes after blood collection, centrifuge the samples for 15 minutes at 1500 x g in a swing out centrifuge (to pellet the blood plates).
- Transfer plasma to the necessary number of 1.5 mL Eppendorf tubes. To avoid contamination of plasma with intact cells, be very careful not to touch the buffy coat layer (which is located between the red blood cells and the plasma). Stop pipetting 0.5 cm above the buffy coat layer.
- Centrifuge the plasma immediately (within 15 min after the first centrifugation round ended) for 15 min

at 15 000 x g in a fixed rotor centrifuge (this step removes cell debris). Transfer 90 % of the top plasma to storage tubes; be sure to leave the bottom 10 % to insure no cells are transferred.

- Transfer the plasma to approx. 15 (Matrix) tubes, 250 μ L per aliquot
 - Work on a block of dry ice, the plasma will start to freeze immediately.
- Scan/register the tubes in the Tracking solution/database
- Freeze the tubes at -80 °C

BD™ P100 proteomics protocol, v02:

- Be sure to read the blood collection procedure given by the manufacturer (BD)
- Store tubes protected from light until centrifugation
- Centrifuge for 30 minutes at 1600 x g in a swing out centrifuge
- Transfer plasma to approx. 12 (Matrix) tubes, 250 μ L per aliquot
 - Work on a block of dry ice, the plasma will start to freeze immediately.
- Scan/register the tubes in the Tracking solution/database
- Freeze the tubes at -80 °C (freeze within 1-2 hours after sampling)

CTAD cytokine protocol, v01:

- Store tubes protected from light until centrifugation
- Centrifuge for 20 minutes at 2000 x g in a swing out centrifuge
- Transfer the plasma to approx 18 (Matrix) tubes, 250 μ L per aliquot
 - Work on a block of dry ice, the plasma will start to freeze immediately.
- Scan/register the tubes in the Tracking solution/database
- Freeze the tubes at -80 °C (freeze within 1-2 hours after sampling)

EDTA full blood for DNA extraction, v01:

- Scan/register the tubes in the Tracking solution/database
- Freeze the tubes at -80 °C
- Extract DNA by preferred method
- Measure concentration and quality parameters (e.g.: 260/280 and 260/230 at a NanoDrop® instrument)
- Scan/register tubes with aliquoted DNA in the Tracking solution/database

PAXgene™ tubes for RNA extraction, v02:

- Follow the blood collection procedure given by the manufacturer
- Scan/register the tubes in the Tracking solution/database
- Freeze the tubes at -20 °C (24 h)/ -80 °C
- Extract RNA with the help of PAXgene™ blood RNA Kit for RNA extraction or PAXgene™ blood miRNA Kit for RNA extraction (PreAnalytiX, Qiagen/BD).
- Measure concentration and quality parameters (e.g.: the RIN-value at a Bioanalyzer instrument)
- Scan/register tubes with aliquoted RNA in the Tracking solution/database

Chapter 3 – Urine collection

Urine protocol, v02:

- Morning urine (if possible) is collected
 - Either at home and brought to the hospital the same day, or when the patient is hospitalized or at the outpatient clinic.
- Keep refrigerated until aliquotation (always freeze same day as sampled)
- Transfer the urine to storage tubes, make sure to make several aliquots
- Scan/register the tubes in the Tracking solution/database
- Freeze the tubes at -80 °C

Chapter 4 – Feces for gut microbiota (DNA) studies

We use PSP® Spin Stool DNA sampling tube (Invitex), in addition to an empty sampling tube. Sample collection device is bought from Ability Building Center, USA (Protocol 120 Disp Stool Collection Device, art no: 1030. Contact person Julia Ramsey, juliar@abcinc.org).

Patients are given the equipment necessary to perform sampling at home. Samples are then sent via regular mail back to the hospital. Envelopes must be marked with the diamond shaped “UN3373”-logo and the text “Biological Substance, Category B” and shipment containers with absorbable material must be used for the PSP sampling tubes – since they contain liquids. Please consult local authorities for details. (In practice United Nations Packing Instruction 650 is used world-wide).

Feces sampling procedure, v01 (given to the patient):

- If you are on antibiotics, please wait 4 weeks from the last tablet taken.
- Due to the time limit, please send samples only on Mondays–Wednesday. The samples must not be older than 24 hours when they are shipped (sample quality is reduced after day 3).
- Sample tubes and questionnaire have been labeled with a unique study number.
- At the sampling time, please make sure to not contaminate the stool sample with urine.
- Sit down and collect the stool sample directly in to collection device (please see directions underneath).

For all participants we register:

- Age
- Sex
- Ethnicity
- Height and weight (BMI)
- Geographical localization (if international study)
- The use of antibiotics the last 3 months (type and dose/time period)
- Smoking
- Medications (use check boxes if you are interested in specific medications)
- Chronic diseases
- Longer stays abroad (more than 4 weeks in length, during the last 12 months) – What country, how long and when
- Acute bowel symptoms (vomit AND/OR diarrhea) last 4 weeks
- Colectomy (removal of the bowel) AND/OR enterostomy (eg. ileostomy)
- Regular use of probiotics (and/or prebiotica) – listed
- Diet – in principle two ways to collect data:
 - As a minimum; gather info regarding special diets:
 - Eg. vegetarian diet, vegan diet, non gluten diet, low-carbohydrate.

- If more details are needed (recommended); use a food-frequency questionnaires (FFQ) or food-recall questionnaires (RFQ).

For further details see: <http://www.microbiome-standards.org/> and MiSX standards: <http://gensc.org/projects/mixs-gsc-project/>

Upon reception of samples in the biobank:

- Check study number on form and samples
- Register the sample date/time and reception date/time in a database. Contact patients if information is missing.
- Freeze the samples at - 80 °C

DNA from the stool sample in the PSP tube is extracted with the PSP Spin Stool DNA Plus Kit (Nordic Biolabs). Extracted DNA is aliquoted to (matrix) tubes (eg. 30 µl in 4 tubes)

- Measure concentration and quality parameters (e.g.: 260/280 and 260/230 at a NanoDrop® instrument)
- Scan/register the tubes in the Tracking solution/database
- Freeze the tubes at -80 °C

Chapter 5 – Brush cytology and bile from ERCP

Equipment needed:

Liquid nitrogen (LN) in a thermos

Ice cubes in a polystyrene box

Tubes for brush cytology sample

Tubes for bile

Sampling form (see attachment 2)

Sampling, main points:

Brush cytology sample from ERCP, v01:

- Transfer the brush sample to an empty tube and place in thermos with LN
- In the biobank:
 - Scan/register the tube in the Tracking solution/database
 - Freeze the tube at -80 °C

Bile from ERCP, v01 (with or without protease inhibitor):

- Transfer the bile to an empty tube
- Place on ice
- In the biobank:
 - Add protease inhibitor (art no. P8340, SigmaAldrich) to some of the bile volume (10

μ l protease inhibitor + 1 ml bile, mix and aliquote)

- Aliquot bile with and without protease inhibitor to storage tubes (keep the samples on ice)
- Scan/register the tubes in the Tracking solution/database
- Freeze the tubes at -80°C

Chapter 6 – Sampling from explanted liver

Two equipment packages are pre-made for the protocol, one from the surgical department and one from the biobank.

Equipment package 1 (Surgical Dept):

Scalpel and blades

Probe (anatomical)

Scissors

Forceps and Pean's forceps

Gloves

Table (trolley)

Table cover

Cover/box to put explanted liver on while sampling

Wet ice

Bucket for the liver (transport to pathology dept)

Equipment package 2 (Biobank):

Dry-ice in polystyrene box

2-methylbutane, ice cold (stored in small bottles at -80)

Liquid nitrogen in thermos

Extra polystyrene box for wet ice

Tubes (for the samples), including nunc tubes with protease inhibitor (10 μ L, art no. P8340, SigmaAldrich)

Paraformaldehyde (4 % in buffer)

Single-use plastic pipettes

Biopsy needle (we use T Lok Bone Marrow Biopsy Needle, Angiotech Denmark A/S), diameter 1,8mm.

Timer

Sampling form (see attachment 3)

Sampling procedure from explanted liver:

- Start the timer when the liver is taken out! The time from the liver is out to the respective samples are in place in the tubes must be registered on the sampling form.
- Start immediately with 4 cylinder biopsies (40mm, 1,8mm) from the surface of each lobe of the liver for preparation with 2-methylbutane.
- Take 4 cylinder biopsies from the portal area/hilar region of each lobe (for 2-methylbutane).
- Make a hole in the gallbladder for pipetting bile. Collect up to 3 x 1 ml of bile in tubes with protease inhibitor (make sure to turn the tubes 5 times to disperse the protease inhibitor evenly), and 3 x 1 ml in empty tubes. Use sterile plastic pipettes and transfer place the tubes on wet ice.
- Take 2 longitudinal surgical biopsies from the gall bladder using a scalpel (for 2-methylbutane).
- Take a total of 4 needle biopsies from each liver lobe for paraformaldehyde preparation, 2 from the surface and 2 from the deep/hilar regions.
- If tumor or clearly enlarged lymph nodes are identified, take 4 surgical biopsies for preparation with 2-methylbutane, 1 for paraformaldehyde. (Discussion with surgeon may be necessary)
- Finish by making large slices (1,5 cm thick) in the liver before final paraformaldehyde fixation for pathology dept.

In the biobank:

Tissue treated with 2-methylbutane, v01:

- Scan/register the tube in the Tracking solution/database
 - Make sure to describe the biopsies in detail
- Store the biopsies in the gas phase of LN2

Tissue treated with formaldehyde, v01:

- Scan/register the tube in the Tracking solution/database
 - Make sure to describe the biopsies in detail
- Store the biopsies in room temperature (short-term storage, 24 h)
- Long-term storage in paraffin blocks after routine preparation

Bile from liver transplantation, v01 (with or without protease inhibitor)

- Aliquot (keep the samples on ice)
- Scan/register the tube in the Tracking solution/database
- Freeze the tubes at -80 °C

Chapter 7 – Ultrasound elastography

An annual ultrasound exam of the liver is recommended in current guidelines for the follow-up of patients with PSC, as a means of surveillance with regard to the development of fibrosis and cirrhosis, portal hypertension, malignant liver lesions and gall bladder polyps. Point shear wave elastography has emerged as a new tool to evaluate liver fibrosis, measuring the speed of ultrasound-initiated shear waves through the liver tissue as an expression of tissue elasticity, which is correlated to histological grade of fibrosis. Point shear wave elastography may be performed by ARFI (Siemens) or ElastPQ (Philips), or more recently developed applications. Information on BMI and liver tests (transaminases to evaluate liver inflammation, bilirubin to evaluate cholestasis; preferably within a week) improve the interpretation of elastography results.

Standard ultrasound of the liver, bile ducts and spleen

- Routine B-mode scan through the liver, bile ducts and portal area with a 3.5-5 MHz probe. Describe the liver capsule (regular / irregular), parenchyma (homogeneous / coarse), any left lobe hypertrophy, ascites, bile duct variability or lesions.
- Measure the gallbladder length (and width) and maximum wall thickness, note any gall bladder polyps (and measure the size).
- Measure the spleen length and width.

- Doppler ultrasound: Measure the portal vein diameter and note whether the flow is inverted. Evaluate the hepatic vein flow profile (triphasic or blunted?).

Ultrasound elastography by point shear wave elastography

- Note which instrument and probe are being used, as well as investigator.
- The patient should be fasting for at least 3 hours, placed in the supine position with the right arm maximally abducted, and instructed to stop breathing with a relaxed mid-breath hold during acquisitions. Measurements should be made in the right intercostal space for the right liver lobe, in an area free of large vessels or bile ducts, at 2-6 cm from the liver capsule.
- Ten valid acquisitions and a success rate (SR) > 60 % are needed for a valid measurement. The mean, SD and median shear wave velocity in m/s of 10 valid acquisitions should be noted, as well as the total number of acquisitions and the number of failed acquisitions (in order to evaluate the SR).
- Measurements may also be performed in the left liver lobe through a subcostal position in the midline, and in the spleen through a left intercostal position.

Chapter 8 – GI sampling protocol

This protocol (see attachment 4) is a modification of the protocol used in the IBSEN study (Inflammatory Bowel South-Eastern Norway), and is used to gather biological material and clinical information from patients with inflammatory bowel disease (IBD) and other gastrointestinal phenotypes including control populations.

Blood samples are taken as describes in Chapter 2. Blood sampling is performed after the patient has emptied their bowel, but before the endoscopic procedure. Clinical data is registered in a separate Access database.

For standardized registration of gastrointestinal symptoms we use the GSRS-self form. Please contact AstraZeneca if you are interested in using this form:

PROinformation@astrazeneca.com

Appendix
Attachment 1

SAMPLES FOR BIOBANK (example)
Blood samples

Patient ID:

Date/time:

Is the patient fasting: Yes/ No

Sampler (Sign):

Number of aliquots:

_____	EDTA plasma
_____	BD P100 plasma, lot no:
_____	Serum
_____	CTAD, lot no:

Comments/deviations from protocol:

Attachment 2

SAMPLES FOR BIOBANK (example)

Brush cytology and bile from ERCP

Patient ID:

Date:

Which categories were sampled:

Brush cytology sample

Bile

Contrast present:

Yes No

Yes No

Endoscopist:

Samples collected by:

Samples aliquoted by:

Comments/deviations from protocol:

Attachment 3

SAMPLES FOR BIOBANK (example)

Tissue and bile samples from liver explants

Patient ID:

Date:

When (time) was the liver taken out:

When (time) was all sampling finished:

Which categories were sampled:

- Liver tissue (Snap Freeze)
- Liver tissue (paraformaldehyde)
- Lymph nodes
- Tumor
- Bile
- Gallstone
- Pus

Sampler:

Comments/deviations from protocol:

Sample list

Tube no	Description	Time from explant
Tube 1		
Tube 2		
Tube 3		
Tube 4		
Tube 5		
Tube 6		
Tube 7		
Tube 8		
Tube 9		
Tube 10		
Tube 11		
Etc.		
Tube 35		

GI Sampling Protocol

PSC - IBD

Registration date: ___/___/___
(DD/MM/YYYY)

Patient ID: _____



Diagnosis

- Ulcerative colitis
- Crohn's disease
- IBD-unclassified
- Control
- Other:

Demographics

Date of birth: ___/___/_____ Female Male

Diagnosis:

A) IBD date of diagnosis: ___/___/_____

Diagnosis at which hospital:

Type of IBD:

- Ulcerative colitis
- Crohn's disease Large bowel Small bowel
- IBD-unclassified

B) Control patient, diagnose:

Date of diagnosis: ___/___/_____

Indication for endoscopy:
.....

Smoking (if the person is actively smoking, please register today's date as the "to date")

No Yes Unknown

From: ___/___/_____ To: ___/___/_____

From: ___/___/_____ To: ___/___/_____

Approx. amount of cigarettes per day: __ __

Previous/associated diseases

- Yes No Erythema nodosum
- Yes No Pyoderma gangrenosum
- Yes No Uveitis
- Yes No Celiac disease
- Yes No Thyroid disease. If yes, what type:
- Yes No Type 1 diabetes
- Yes No Rheumatoid arthritis
- Yes No Sjögren's syndrome
- Yes No Glomerulonephritis
- Yes No Vitiligo
- Yes No Sarcoidosis
- Yes No Sacroiliitis
- Yes No Psoriasis
- Yes No Cancer. If yes, what type:.....

Other diseases:

.....

.....

.....

.....

.....

Ongoing medication

.....From date: __/__/_____

Adm. form:Reason: IBD Other:.....

.....From date: __/__/_____

Adm. form:Reason: IBD Other:

.....From date: __/__/_____

Adm. form:Reason: IBD Other:

.....From date: __/__/_____

Adm. form:Reason: IBD Other:

.....From date: __/__/_____

Adm. form:Reason: IBD Other:

.....From date: __/__/_____

Adm. form:Reason: IBD Other:

.....From date: __/__/_____

Adm. form:Reason: IBD Other:

.....From date: __/__/_____

Adm. form:Reason: IBD Other:

Simple clinical colitis activity index*

Symptom (during the last 24 hours)	Score
Bowel frequency (day) <ul style="list-style-type: none"> ▪ 1-3 ▪ 4-6 ▪ 7-9 ▪ >9 	0 1 2 3
Bowel frequency (night) <ul style="list-style-type: none"> ▪ 0 ▪ 1-3 ▪ 4-6 	0 1 2
Urgency of defecation <ul style="list-style-type: none"> ▪ None ▪ Hurry ▪ Immediately ▪ Incontinence 	0 1 2 3
Blood in stool <ul style="list-style-type: none"> ▪ None ▪ Trace ▪ Occasionally frank ▪ Usually frank 	0 1 2 3
General well-being <ul style="list-style-type: none"> ▪ Very well ▪ Slightly below par ▪ Poor ▪ Very poor ▪ Terrible 	0 1 2 3 4
Extracolonic features <ul style="list-style-type: none"> ▪ Arthritis ▪ Pyoderma gangrenosum ▪ Erythema nodosum ▪ Uveitis 	1 per manifestation
SUM	

Walmsley et al, 1998

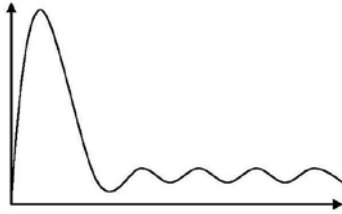
Harvey-Bradshaw Index for Crohn`s disease*

Symptom (during the last 24 hours)	Score
General wellbeing <ul style="list-style-type: none"> ▪ very well ▪ slightly below par ▪ poor ▪ very poor ▪ terrible 	0 1 2 3 4
Abdominal pain <ul style="list-style-type: none"> ▪ none ▪ mild ▪ moderate ▪ severe 	0 1 2 3
Number of liquid stools per day	1 point per bowel movement
Abdominal mass <ul style="list-style-type: none"> ▪ none ▪ dubious ▪ definite ▪ definite and tender 	0 1 2 3
General well-being <ul style="list-style-type: none"> ▪ Very well ▪ Slightly below par ▪ Poor ▪ Very poor ▪ Terrible 	0 1 2 3 4
Complications <ul style="list-style-type: none"> ▪ arthralgia ▪ uveitis ▪ erytema nodosum ▪ pyoderma gangrenosum ▪ aphtous ulcers ▪ anal fissure ▪ new fistula ▪ abscess 	1 point per complication
SUM	

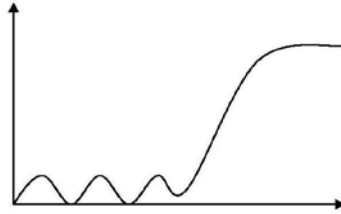
* Harvey RF, Lancet, 1980

IBD activity

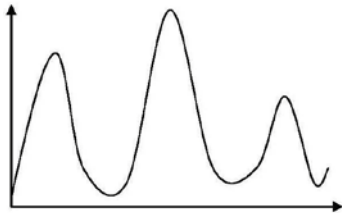
The course of IBD from the time of diagnosis until the date of registration date, based on the patient's own opinion of their IBD symptoms



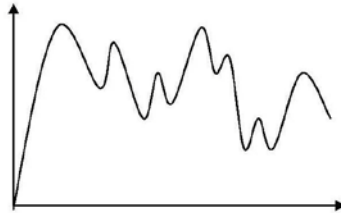
Curve 1: Decrease in the intensity of symptoms during the follow-up period.



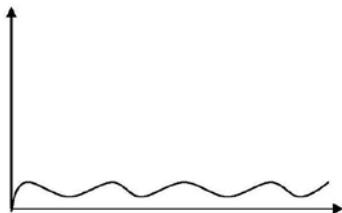
Curve 2: Increase in the intensity of symptoms during the follow-up period.



Curve 3: A chronic, intermittent course.



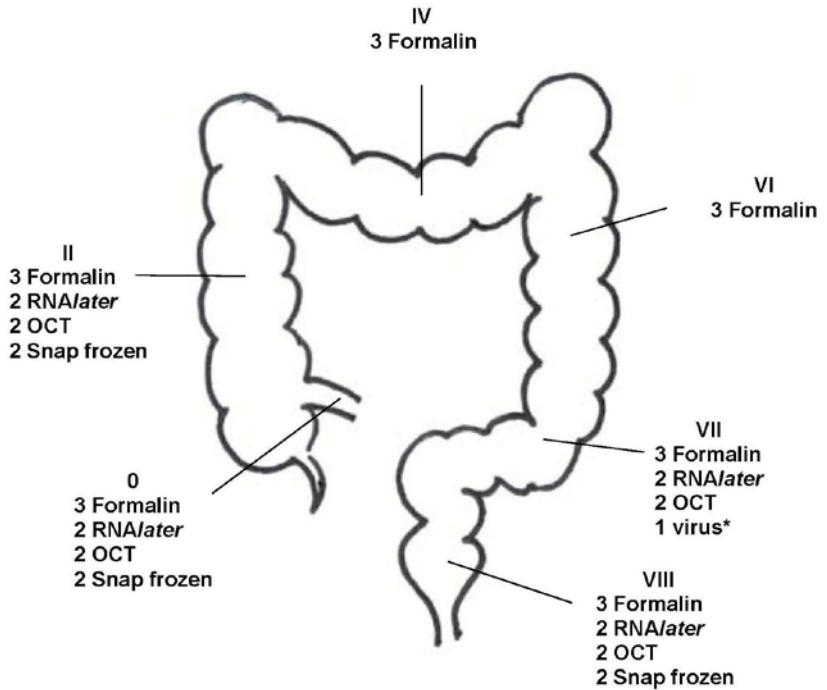
Curve 4: A chronic, continuous course.



Curve 5: Quiescent course.

Findings at Colonoscopy

Date (DD/MM/YYYY):



*If lesion compatible with virus infection is present, please take virus test.

Macroscopic colonic findings

	TERMINAL ILEUM	ASCENDING COLON	TRANSVERSE COLON
Normal	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Diffuse inflamm.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Mild UC**	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Moderate UC**	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Severe UC**	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Focal inflamm.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Aphthous lesions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Ulcerations	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Stenosis	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Atrophy	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pseudopolyps	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Polyp<1cm	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Flat lesion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Tumor	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Table continues on next page..

	DESCENDING COLON	SIGMOID COLON	RECTUM
Normal	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Diffuse inflamm.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Mild UC**	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Moderate UC**	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Severe UC**	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Focal inflamm.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Aphthous lesions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Ulcerations	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Stenosis	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Atrophy	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pseudopolyps	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Polyp<1cm	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Flat lesion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Tumor	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

****Definition, inflammatory activity at UC (Mayo Score)**

Mild disease: erythema, decreased vascular pattern, minimal friability.

Moderate disease: marked erythema, frank friability, absent vascular pattern, erosions.

Severe disease: mucopus, spontaneous bleeding, ulcerations.

Microscopic colonic findings

BLOCK NUMBER: _____

	Terminal ileum	Ascending colon	Transverse colon
Normal	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Inflammation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Chronic	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Active mild	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Active mod.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Active severe	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Aphthous lesions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Ulcerations	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Granuloma	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Other inflammatory changes

Atrophy	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Crypt distortion	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Neoplasia

LGD	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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HGD	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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DALM	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Carcinoma	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Other pathological findings

Collagen	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Other _____

BLOCK NUMBER: _____

	Descend. colon	Sigmoid colon	Rectum
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Normal	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Inflammation	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Chronic	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Active mild	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Active mod.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Active severe	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Aphthous lesions	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Ulcerations	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Granuloma	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Other inflammatory changes

Atrophy	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Cypt dist.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Neoplasia

LGD	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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HGD	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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DALM	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Carcinoma	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Other pathological findings

Collagen	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
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Other _____	_____	_____	_____
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