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CASE NOTES**

Programme 7. - The Bowel

RADIO 4

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PRESENTER:

MARK PORTER

PORTER

Hello. Today's programme is all about the bowel - one of the biggest and busiest organs in the body, and one that's particularly prone to problems. At least a third of the adult population in the UK live with some form of ongoing bowel trouble - everything from mouth ulcers to piles and a lot more in between!

Cancer of the bowel kills 16,000 people a year in the UK. The much anticipated launch of the National Bowel Cancer Screening Programme has been postponed. It was due to start in April, and despite concerns that it is another victim of the financial crisis in the NHS, the authorities are confident it will be rolled out later in the year. We visit a small charity in Sussex who have beaten the NHS to it and are already offering free screening.

And I'll be finding out how plantains - a type of large green banana - might be used to help people with the inflammatory bowel condition Crohn's disease.

My guest today is Dr Anton Emmanuel who's a consultant gastroenterologist and senior lecturer in neurogastroenterology at the University College Hospital, London.

Anton, let's start with what's normal. How long does it take food to get from the top to the bottom?

EMMANUEL

There's a huge variety in terms of range of what's normal but it's between the order of 24 hours to about 48 hours for the typical person.

PORTER

And let's look at the functions of each stage. What's happening in the stomach?

EMMANUEL

Well most of the time your food is moving through you it's spent in the bowel, so your stomach only has food for about an hour or two, according to whether it's solid or liquid. And it basically grinds it up and then pushes it into your small intestine where the bulk of the work in terms of absorbing calories and nutrients and minerals occurs. That whole process of moving through 20- or 30-odd foot of bowel occurs in a few hours, maybe three or four hours. And the next 20 to 30 hours is then spent in your colon itself as the bowel content becomes more and more dehydrated, in other words the liquid and secretions in your gut become drier as the colon reabsorbs the liquids.

PORTER

And then the last bit - the stool - travels down into the rectum, the last bit of the large bowel. How do we know when to go to the loo?

EMMANUEL

What happens is that as your food moves down and becomes stool it gradually fills up your rectum, which as you say is like a tank, and once that tank reaches a certain level of fullness, which varies from person to person, they get the urge or the call to open their bowels. And typically for the average male, certainly, it occurs once every day, roughly in the mornings.

PORTER

And what's controlling the process from top to bottom, obviously when you're chewing and swallowing you can initiate the procedure but then it's automatic isn't it?

EMMANUEL

Yes everything that happens to your bowel from the point at which you swallow through the point to which you have that urge we mentioned is all subconscious and it's controlled by something called the autonomic nerves. And all that occurs completely without your control. There are certain nerve and reflex things which happen, there are certain hormonal things that happen which can influence that but again most of those things are out of your control unless sometimes, therapeutically, as treatments we try and exploit those.

PORTER

As a nation we are somewhat obsessed with how often we go to the loo, does it matter how often we go?

EMMANUEL

Not remotely, it really doesn't matter. One of the key things that I think doctors can tell patients is to remind them that providing you're comfortable going to the loo once a week or three times a day is actually in inverted commas normal, it's whatever suits.

PORTER

There is a belief that the lining of the last part of the bowel - the colon and the rectum - is akin to a land drain - dirty and caked with deposits - but that's not the case.

EMMANUEL

Absolutely not, no you have just to examine the bowel with a colonoscope, which we do frequently, and you'll see that it actually looks exactly the inside of your mouth when you brush your teeth. So it's not - I mean it is something which tends to make me rub my eyes but the whole point about the bowel is that it's meant to be this organ which deals with bacteria, which deals with refuse from food and it does so in a completely harmless way.

PORTER

Well it is hardly surprising that things can go wrong when you consider the sheer size and complexity of the bowel. Cancer of the bowel is the second biggest cancer killer in the UK, after lung cancer, and is responsible for around 16,000 deaths a year across the country.

Although there is 90% cure rate if caught early, less than 1 in 10 cancers are caught at this stage complicating treatment and reducing the overall survival rate to well below 50%.

The National Screening Committee estimate that a bowel cancer screening programme - based on a simple test looking for blood in the stool samples of people aged between 60 and 70 - could save up to 3,000 lives a year.

But the Sussex based Mary How Trust for Cancer Prevention are ahead of the game and have been offering a similar service for years. In 2005 they screened 1200 people - for free. We sent Barbara Myers to find out more.

MYERS

It is a most unlikely setting but here in Church Street in this sleepy Sussex village, just past Suter the family butcher is the Mary How Clinic. It's a screening centre which carries out no fewer than 1200 bowel cancer tests every year and all in memory of a much loved

local resident.

TROWNSON

Mary How was diagnosed with bowel cancer in 1984. Sadly she died in 1987 leaving two young children and a husband. Mary was a resident of West Chiltington here in West Sussex and at that time both her husband and her GP founded the trust with the idea that the bowel cancer which she died from could be found by a simple haemoccult test and that this should be made freely available to anybody and everybody with no charge.

MYERS

Stuart Trownsong, who as manager of the Mary How trust is responsible for raising the many thousands of pounds needed to fund the free service.

SNELL

I was 40 years old at the time and like most men that age was really more concerned with beer and football scores, I don't think I'd even heard of bowel cancer, probably more worried about lung cancer having been a smoker since late teenage years.

MYERS

John Snell came to the Mary How Trust for screening five years ago.

SNELL

The standard test kit that we were issued with included I think what one might colloquially call a poo smear test looking for blood in your stool. And a little test showed the reaction that there was blood present but no other symptom at all. There was no red material in the pan when going to the toilet. So there was no indication to a lay person that they were passing blood.

MYERS

So were you there when the test was done?

SNELL

Yes I was. But the nurse very kindly suggested that perhaps I go away and do it again on the basis that perhaps one might have been a freak result of some description. They immediately referred me to my GP and my GP without wanting to see me himself referred me up to the local NHS hospital for a colonoscopy. And he told me within half an hour that yes I had a tumour and he was able to show me a photograph of it - and a big ugly brute it was too. And it was rated as a Dukes C.

MYERS

So that's stage C which is advanced cancer.

SNELL

It's - I believe so, it's on a scale of A to D, where D is really not very nice at all and A is early stage.

MYERS

So here I am, I'm in the clinic, it's free of charge, it seems only sensible to put myself to the test.

So I've come into the nurses' room to meet Penny Phillips. Penny, you're going to carry out this faecal occult blood test, is that right?

PHILLIPS

That's correct yes.

MYERS

Squeamish though I am a little bit about it, there it is, there's the little envelope, with a sample on it, show me what you're going to do with it.

PHILLIPS

Well the little packet that you've given me I actually open it on the opposite side, the side that you put the samples and through a filter I then add a drop of developer onto the little samples - there are two here - and with one drop of developer on each, as well as one on an indicator we then can see if there's any blood in the specimen.

MYERS

I could have sent it in by post I believe.

PHILLIPS

Indeed you could, yes you could and we would test them as soon as they arrive, the next nurse who comes in.

MYERS

And when you've done this test, as you do on a daily basis with people locally coming into the centre, how often are you having to say to people I'm not happy about that result?

PHILLIPS

Oh I think in the last three months I've probably just had one. So it's not very often.

MYERS

But that's good news isn't it.

PHILLIPS

Oh it's very good news, extremely good news.

MYERS

Because when you get a positive result it's really a bad finding which is to say there's an issue.

PHILLIPS

It's a bad finding, that's correct.

MYERS

And what does happen if there is sign of blood on this test?

PHILLIPS

The GP will do an examination of the patient it could be that the blood has come from haemorrhoids or an anal fissure. But if that isn't the case, if that's not obvious, then he will do a rectal examination and if there's nothing obvious there he will send the patient to a local hospital for further investigations, which would include colonoscopy or even barium enemas. And then if they do find something then they can operate.

MYERS

So actually although it may be bad news to get a sign here of blood on this test, the good news would be that you will then be checked out pretty extensively and if there is a problem you will get treatment that much quicker.

PHILLIPS

Absolutely, straightaway.

SNELL

A lot of life's other little noises suddenly get tuned out and you need to do a lot of very

quick thinking about what you're going to do next and of course there was no option, the tumour had to come out. Which they did - which it came out very quickly and I hope they kicked it round the car park good and proper.

MYERS

And how are you now?

SNELL

I feel I'm in very good health. I've had the benefit of a brilliant surgeon who's kept a very close eye on me for the last five - nearly five years. I'm at the end of my five year supervisory period, I've had a CT scan every six months, I've had a further colonoscopy examination, I have one further CT scan to do, I feel in very good health. And very much more relaxed and happy with life than I was before. Priorities have changed somewhat.

MYERS

So what about my result? Just a couple of minutes later there it is.

PHILLIPS

You can see the indicator - how blue it is - and you can see on the specimens there's been no change. The news today is that there's no sign of any blood in the stool specimens you've brought today but it doesn't mean you stop being vigilant. The test is only as good as those specimens today but we would test you again in three years time.

PORTER

Barbara Myers at the Mary How Trust for Cancer Prevention.

You're listening to Case Notes, I'm Dr Mark Porter and I am discussing the bowel with my guest gastroenterologist Anton Emmanuel.

Anton - if that test had been positive, if you have a positive faecal occult blood, there is blood in your stool, what are the chances that you've got cancer?

EMMANUEL

The chance of having a cancer are very low still, that's important to remember - that the test isn't something that one should panic about if it's shown up as being positive, only about 1 person in 35 or 36 i.e. about 3% will actually have a cancer to worry about. There may be a polyp, which can occur in about 1 person in 6 if you have a positive test and that's important because that's a precancerous lesion and a good time to get it.

PORTER

Actually doing the screening you're having a look with your camera you can whip that polyp off and prevent a cancer from forming.

EMMANUEL

Absolutely.

PORTER

Where are we currently with the National Bowel Cancer Screening Programme? It's been postponed from its April launch - indefinitely?

EMMANUEL

No, no I think we're all fairly sure it's going to happen because all of us are gearing up for the extra workload in hospitals that will come from the screening appropriately, so I'm sure it will happen. Essentially it's been put on hold while a few things are - infrastructural things are put into place, like getting availability for the right population, getting lists of population available, so that everyone who is eligible is approached.

PORTER

Because with all these false positives - because presumably the test is going to be based on a similar test to that one - the stool blood test?

EMMANUEL

That's the plan.

PORTER

An awful lot of false positives are going to be sent into the hospital - that's what screening programmes are all about - so it's got big resource implications for you.

EMMANUEL

It's a big implication for patients, for general practice and for hospitals inevitably because that's where most of the money is spent also.

PORTER

One quick question - in England it's starting at 60, within Scotland it's starting at 50 - who's right?

EMMANUEL

I think pragmatism is probably what's right here. I think the reason it's 60 in England is because the population - if you include the 50 year olds and upwards you'd have a much larger population to screen without the particular resource that [indistinct word]. And so I think 50 is the age that's been used for the small population in Scotland.

PORTER

Ideally for your case, for instance, if it wasn't a national bowel cancer screening programme what age would you like to be screened at?

EMMANUEL

Yeah this is always a question that doctors don't like being asked I guess, what did I do. I think given that we know that most cancers have been in the body for about 10 years or more at the time at which they present and that most cancers present in your 60s, my personal wish would be to be screened at 50 personally.

PORTER

Okay let's move on to another hot topic in the world of bowels, that's bacteria. There are billions of bacteria living in the bowel and they're fairly crucial to the normal functioning.

EMMANUEL

There are absolutely billions of bacteria living in the bowel, there are more bacteria sitting in your bowel now, as you sit there, than there are people who have ever lived on the face of the earth. There are more bacterial cells inside you than there are human cells. So actually you're a minority part of your own body at the moment. And the mystery is that we actually know almost nothing about them, we can only grow about 1% of what is there in our cultures in the laboratories and that's growing them, if we can't really grow them we can't tell you much about function and we know almost nothing about their function. So it's a really potentially a huge area and one which we could exploit and one which may cause disease in as much as we can exploit.

PORTER

You say exploit, I mean it's interesting that you know that probiotic healthy drinks are very much flavour of the month at the moment, what's the establishment's view of those? You're at the forefront of research, is it an area of promise?

EMMANUEL

I think it's an area of enormous promise, certainly it offers a whole new target area of

drugs. And the point is that there is genuinely a balance between so called good and bad bacteria and by altering that balance in one's favour you can improve health, that's clear from the research. So I'm sure it is something that we should be focusing energy on. The problem is that, as I say, we know so little about what there is that we can't really give - we're at least a decade away from having generic drugs that we can roll out.

PORTER

You're talking about a decade - of course not all bacteria in the bowel are healthy and I remember we used to think ulcers were caused by stress and excessive acid and that was another bacteria, wasn't it, h.pylori - which has transformed the treatment of ulcers of the stomach?

EMMANUEL

Completely, no you're absolutely right, I mean bacteria in the wrong places or even good bacterium in the wrong place can be as harmful as a bad bacterium. So no it's not all good bugs.

PORTER

But it's work in progress at the moment.

EMMANUEL

Absolutely.

PORTER

Well *Helicobacter pylori* isn't the only common gut inhabitant that may be causing problems. There is growing interest in the theory that bacteria further down the bowel can cause inflammation in the cells lining the walls which in turn could predispose to, or aggravate, bowel cancer and inflammatory conditions like Crohn's disease and ulcerative colitis.

Around 150,000 people in the UK have Crohn's or ulcerative colitis. The symptoms are very similar and include pain, weight loss and bloody diarrhoea. Both can be very serious and require drastic intervention - including surgical removal of large sections of inflamed and ulcerated bowel.

Mick Saddler's had Crohn's for over a decade.

SADDLER

They started round about the sort of early to mid-90s. I was experiencing a lot of loose diarrhoea and basically stomach cramps, everything I ate seemed to blow me out. I'd been to the doctor's a few times. I'd been diagnosed with everything from a stomach ulcer to lifestyle - because I was a publican at the time, so it was assumed that I drank far too much. And in the end after a year of being put on these pills, that pills, the next thing nothing was happening, so I asked my GP if I could have a private consultancy, which I did with a consultant at the Derby Royal Infirmary, who turned out to be my life saviour. Within 20 minutes he'd diagnosed it as Crohn's disease and he got me on some medication, which was basically they put you on steroids, to see if it could control it. Four months later nothing, it was getting worse and worse and worse and then there was no option but to go to surgery. So basically the majority of symptoms were kind of tiredness, bloatedness and a bit of lack of control in the bowel region.

PORTER

What are your symptoms like now?

SADDLER

In my personal position I have to try and get as much rich food as I can, say five or six little meals a day, each time after you've eaten you just literally take pot luck, it's either

going to stay inside you for quite a while and do you some good or else within 20 minutes you can start to have to trot to the office, as I like to call it.

PORTER

And how many times a day do you end up going?

SADDLER

I can go up to 30 times a day, no problem.

PORTER

So how do you cope with your day-to-day life if I mean literally you do have to be next to a loo?

SADDLER

Basically you live your life round it, you can't really plan to go anywhere a day ahead because it depends what you're going to be like. The rest of the family, my kids, if they want to spend an hour in the bath they have to check first whether I'm likely to want the loo and they're absolutely brilliant with that.

PORTER

What about medication, do you have to take medication on a daily basis?

SADDLER

If I start to really get bad I would go back on steroids over a period of about eight weeks. You can take a thing called Buscopan, which stop the stomach cramps, although I tend to avoid it because I find it aggravates me a bit, with other people it might be fine. Basically there's a thing called Questran, that enables you to lead a little bit of a life inasmuch that you can get out - all it does is it bungs you up completely inside. When it wears off after anything between two and four hours then all hell is let loose shall we say.

PORTER

Mick Saddler talking to me earlier.

Now back to those bacteria in the bowel wall. Could treatments aimed at protecting the bowel wall from them help reduce inflammation and ease symptoms like Mike's? Jonathan Rhodes, Professor of Medicine at the Royal Liverpool University Hospital, thinks they might.

RHODES

What we've been doing is looking at the bacteria which are particularly close to the cells that line the colon and we've done that by taking very small biopsies from patients attending for colonoscopy, which is endoscopy of the lower bowel for diagnostic reasons. We remove the mucus layer and then look to see what's underneath this sort of slimy mucus layer. And in fact in normal healthy adults there's often very few bacteria actually underneath the slimy mucus coat. But we find that in Crohn's disease and in bowel cancer at least half the individuals we look at, arguably slightly more, we tend to find bacteria in that layer underneath where the mucus sits and that very commonly these bacteria are E.coli, they're not the sort of hamburger aggressive obviously pathogenic E. coli, they're E. coli that are a little bit out of the ordinary compared with normal so called commensal E. coli, in that they tend to stick to epithelial cells and we think therefore maybe able to provoke an inflammatory response.

PORTER

That begs the question - the chicken and the egg. Is it something that's changing in the bowel lining of someone with inflammatory bowel disease or bowel cancer that's allowing the bacteria in or do we think the bacteria are triggering some changes that may lead to

those conditions?

RHODES

Well we don't know the answer to that and it's an important question. I think the former is perhaps more likely, that there's some change in the mucosa that allows these bugs to accumulate there, rather than the bugs themselves have changed the mucosa. But of course once they're there they then may become part of the disease causing process and that may involve different mechanisms in Crohn's disease and in bowel cancer. And I should say that in Crohn's disease there's pretty general acceptance that bacteria must have something to do with the causation. In bowel cancer it's a much more controversial hypothesis that bacteria may have something to do with it.

PORTER

So what can we do to influence this process, to protect those cells lining the bowel wall?

RHODES

Well what we're trying to do is to identify something which could be taken easily by mouth, ideally obviously a component of the normal diet, and that might prevent recruitment of these bacteria to the mucosal wall. And we're conscious of the very clearly established fact that the inflammatory bowel disease - Crohn's disease and ulcerative colitis and bowel cancer - all tend to be much commoner in Western or westernised countries and countries that traditionally don't eat processed food, don't eat too much meat, eat lots of leafy green vegetables, maybe eat quite a bit of fruit and so on all tend to have low rates for bowel cancer and inflammatory bowel disease. So what we did was to screen quite a range of different substances, mainly naturally occurring substances, in the laboratory for their ability to stop these E. coli from sticking to cells, the type of cells that line the colon. And we found actually that surprisingly few of the things we tested were able to do this but one of the things which did do it well was soluble fibre from plantains, which is a member of the banana family, usually eaten as a vegetable - the sort of large bananas that usually have to be cooked.

PORTER

And in what sort of dosage would you have to consume plantains or an equivalent?

RHODES

Well it's a very rough extrapolation at the moment from our laboratory data and we hope but obviously we haven't yet proved if we give 5 grams twice a day, which would be the equivalent roughly of all the fibre from one of these large unripe plantains, that should, we think, produce the concentration in the bowel that would be similar to the concentration that we use in the laboratory.

PORTER

So what stage are you at in the research now?

RHODES

We're just developing the preparation, which has obviously got to be sort of palatable and in an easy to take formulation. It's being tried out in a few healthy volunteers, just to make sure it doesn't give them terrible bloating or stomach cramps, but we don't think it will. And so we're about to submit a trial protocol to the Essex Committee and hopefully we'll be ready to start a trial, in parentheses, in about three months time.

PORTER

And you'd be using this as something that people would use as a maintenance treatment, to keep things under control, to reduce the number of flare ups or emissions that they have?

RHODES

I think so, we're actually aiming to do two trials, one of maintenance and one of actual treatment of active disease. But it may be over optimistic to think we'll actually settle down disease which is already active. So I think maintenance may be a more plausible role.

PORTER

What about using antibiotics in Crohn's disease because presumably another way of tackling this problem in the short term anyway would be to try and eliminate these E. coli or reduce their numbers through administering antibiotics, do they have any role to play in the treatment of Crohn's?

RHODES

Well I think they do and they've really been under investigated up till now. It depends what bug you think you're trying to treat and where you think the bug is and the evidence has been very confused on that but I think it's gradually firming up. It is looking, not just from our own work but from several other centres, that E. coli may be really quite important. It also looks as if they end up inside white blood cells, macrophages, in Crohn's tissue and some antibiotics are very poor at penetrating into those cells. So at the moment another bit of research we're doing is actually to screen commonly used antibiotics in the laboratory for their ability to kill these E. coli inside macrophages.

PORTER

Professor Jonathan Rhodes talking to me earlier.

Anton, at the beginning of the programme I introduced you as a neuro-gastroenterologist. Why are nerves so important to the normal functioning of the bowel?

EMMANUEL

Your gut is a fairly - it's a unique organ plainly - because it has something like a hundred million nerves within the lining of the gut itself, within the muscular layers of the gut, and those nerves essentially act - I often use the analogy of being like sort of traffic around a town - they make the bowel do its own thing. Most of the time it ticks over but sometimes it comes to a logjam. You also have nerves from your brain and your spinal cord which then come down and they act like the sort of traffic lights and roundabouts which regulate that traffic, so in health it makes things normal so that it controls that flow of information through your gut. That's why most of the information that happens in your gut, as I said, it's all subconscious and therefore it depends purely on the nerves to react moment by moment to what you've eaten, to what you're feeling, how hungry you are, etc.

PORTER

What have we learned about the nerve supply to the gut and the way it works from injury, I mean there are patients obviously who have spinal injury who've lost part of that nerve supply?

EMMANUEL

This has really given us lots of insight into how the bowel works because we've learnt that really bowel is in large part a reflexic organ - in other words it responds to a stimulus, something which is subconscious occurs in the gut, like say for example, food is eaten or a bit of the bowel is moved and that in turn causes a reflex action at nervous level to cause the bowel to respond to that, to push it further down or to respond by ...

PORTER

The peristaltic movements, the contractions.

EMMANUEL

All those things are to do with reflexactivity and we know, for example, in spinal injured patients when they lose those long nerves from the brain and spinal cord down to their gut their gut just has no nervous supply which sometimes works but as I say sometimes it comes to a complete logjam and they become severely constipated or the like.

PORTER

So they're losing the traffic lights, if you like, that are ensuring an efficient flow through the bowel, the bowel tries to take over ...

EMMANUEL

Sometimes it works, sometimes it doesn't.

PORTER

... backwards and forwards sometimes.

EMMANUEL

Absolutely.

PORTER

What about more subtle conditions, unlike the normal functions of the bowel, conditions like irritable bowel syndrome, do we know if there's a nerve role there?

EMMANUEL

That's very important, you're absolutely right. We've learned essentially that initially from these very crude type models, like patients with multiple sclerosis or spinal cord injury where there's a very obvious insult to the nervous system, we've also learned that some of these symptoms that those patients have are like exaggerated versions of what people with irritable bowel syndrome suffer and of course IBS is a much more prevalent disorder than these other rarer neurological things. And we've learned essentially that a lot of the problems with IBS patients are to do with abnormal nerve either in the brain or nerve activity in the gut, rather than the old theories we had when we were training that everything was due to muscle spasm or ...

PORTER

Spastic colon yeah.

EMMANUEL

All these things that we've learnt that our bowels are lazy or the like. You know sometimes that's true but the vast majority of IBS is not caused by abnormal spasm in the bowel, it's caused by subtle nerve abnormalities of perception or of sensation in the bowel.

PORTER

And how might that change in our perception of what's going wrong, alter the way that we approach this, in other words what can we do about the treatment?

EMMANUEL

Well it's already changed treatments, a lot of the anti-spasmodic drugs that we relied on for a long time and known aren't very useful ...

PORTER

Which never really worked that well did they.

EMMANUEL

No they don't really and we still use them occasionally for something to do almost but I think we probably shouldn't. And so we're moving towards more nerve based drugs and a lot of the research that's going on now is looking at compounds affecting serotonin,

which is a hormone in our guts and our brains, which influences nerve function. And a lot of the other treatments we use very successfully for IBS like hypnotherapy and biofeedback, these techniques work on nerves primarily rather than muscles. So it's already influencing practice and it will do more and more I'm sure as the years go by.

PORTER

I am afraid we'll have to leave it there, that's all we have time for - Dr Anton Emmanuel, thank you very much.

This is the last programme in the current series. If there are any topics you think we should be covering in the next run then please e-mail me via our website at bbc.co.uk/radio4. If you don't have access to the internet, then you can drop me a line - the Radio 4 Action Line on 0800 044 044 have all the relevant contact details. Case Notes will be back in September - until then, goodbye.