Hello I am Dr Diane Cottle, a clinical editor at BMJ Learning. Welcome to this series of five modules on common problems in childhood. In this second episode, we discuss conditions related to the abdomen. Here to talk to us is Dr Ian Wacogne, Consultant in General Paediatrics at Birmingham Children’s Hospital, and Deputy Editor of the Journal “Archives of Disease in Childhood”.

Hello Ian, thanks for joining us.

In this module, we are going to look at common problems related to the abdomen in children. So to start off with let's look at acute abdominal pain. What are the common causes?
Ian: Oh boy, that’s a long list! I would probably start with things like diarrhoea and vomiting and constipation, then other abdominal infections, so urinary tract infections and the like and various other causes. Then you kind of get the slightly rarer ones like appendicitis, inflammatory bowel diseases, obstruction and so on, and others that are age related. So, in a small child, potentially intussusception and things like that - a very big range.

Diane: So let’s look at a case example: a father arrives with his four year old child who has been crying all night and holding his tummy. What would be your first thoughts?

Ian: I think I need to know a bit more about the history; I think I need to know whether the child has got some blood in the poo, or has got loose stools, or it is vomiting. Interested in the manner of the crying; so for example I think one of the things you are sort of implying there is has this child got an intussusception or something like that. So that would be an agonising cry every 15 or 20 minutes and the child looks very unwell with it. They seem to partially recover for 10 or 15 minutes and then they get very unwell again.

I would be thinking of other features. So for example if this was a textbook situation the pain would start in the middle and migrate to the right iliac fossa. Most people would recognise that as appendicitis. Of course, in the late phases of appendicitis you then get a generalised peritonitis which would present as generalised and acute abdomen.

Obviously if the child is vomiting then what does the vomit look like? If there is green in the vomit, ie a properly dark green bile stained vomit, then that is some sort of obstructive phenomenon. If there is blood in the poo then technically that is dysentery isn’t it? So that would imply some sort of infective or inflammatory process in the bowel and so on.
Diane: So in an examination what would you be looking for?

Ian: Well what I am most worried about is shock; that is what is going to potentially harm the child in the next few minutes to an hour. So I would be looking at the pulse and the capillary fill and the child’s temperature for example. I would be looking for red flag signs that said to me that this child was shocked and I needed to do something urgently and immediately. So in terms of, for example, the NICE guidance on diarrhoea and vomiting, I would be thinking down the right hand side of the diagram which is where I have got suspected clinical shock; certainly in a secondary care environment I would be wanting to get intravenous access.

The next things I would be looking for if I was happy that that wasn’t a particular issue, I would be interested in actually examining the child and having a look at the abdomen, feeling for the classic signs of abdominal pain. This is the difference between just a child who has got some belly ache versus a child who has actually got a genuine peritonitis. So I get rebound tenderness and other features of peritonism.

The other thing that I would always do would be always have a careful look at the genitalia because that is one of my diagnostic blind spots is missing contortion of the testes as a differential of abdominal pain.

Diane: Investigations - what investigations would you do and why?

Ian: I guess it depends on the environment that I am in and whether or not I am in secondary care. I mean assuming I am in secondary care I might try to minimally investigate; so if the child has just got some mild abdominal pain, perhaps a bit of diarrhoea and vomiting, no other
significant symptoms, then I probably would try not to do any further investigations. I might consider doing a urine dipstick if I thought that was a possibility that this was a urinary tract infection.

There is a whole list of things that you could do; you could do blood counts and you could do imaging and you could test the stool etc. But the difficulty is that is not necessarily going to aid your diagnosis and you could get false positives back around that. Certainly if you have got blood in the stool you probably ought to be sending the stool for culture, to look for important organisms like salmonella or shigella or campylobacter and the other dysentery causing organisms. But that is mostly not to treat the child in front of you but as a sort of a public health issue.

Diane: So let's move on to a second case example. A mother brings in her 12 year old daughter. He has had daily pain for three months; she has been sent home from school a couple of times. What are your first thoughts in this case?

Ian: Well my first thoughts are the thought that should technically be my last thought. Let me try and explain that. So my first thought there is that this could be some sort of functional abdominal pain. The reason that should be my last thought rather than my first thought is that actually it is a diagnosis of exclusion. It is a diagnosis, functional abdominal pain or recurrent abdominal pain is when you have ruled out and determined that there isn’t a significant underlying etiology for the pain that has an organic explanation. It is not the same as being made up. But it basically says that you have looked for the serious things that are going on; they aren't there and therefore you are left with a sort of medically unexplained pain.

Diane: So how common is recurrent abdominal pain?
Ian: Well if you came and sat in my clinic you would think it was extremely common. I see quite a lot of it; it is not infrequent at all. One of the main issues is an over investigation and over-medicalisation of what is basically a sort of a normal phenomenon. Some children get abdominal pain and they get very worried. Then if their doctor is doing increasingly aggressive investigations of their abdominal pain and they are very scared, that sort of feeds the cycle.

Diane: What are the causes?

Ian: Well by definition functional abdominal pain doesn’t have a cause; it is without medical cause. Obviously there are things that we would worry about that we are missing; then that is why it is a diagnosis of exclusion. So you would be worried about metabolic conditions; you would be worried about inflammatory conditions. You would be worried about anything that, for example was interfering with growth. By that I mean some sort of chronic longstanding abdominal condition that was making the child genuinely ill rather than simply giving them abdominal pain.

There is a whole bunch of differentials so you know everything - any organ that is in the abdomen can obviously give you some sort of pain, abdomen or pelvis. So there is inflammation or abnormality of any of those organs. But the importance is not to investigate absolutely every possibility.

Diane: So what should GPs be looking for in the history?

Ian: In the history you would be looking for the cycle of the pain; whether it is there at particular times of day. What makes the pain come on?
What makes the pain go away? Is there anything that suggests that it is related to the bowel habit? Is there anything that is related to vomiting? Is there any weight loss? So for example I am much more relaxed about children who appear healthy; got normal levels of energy but who just have some pain and are putting on normal amounts of weight. Weight loss would be unusual and worrying.

Diane: In the examination what should GPs be looking for there?

Ian: In the examination I would do a normal abdominal examination and obviously I would be trying to make it a therapeutic examination by which I mean being reassuring that as I am examining the child or young person, that actually everything looks fine. For example it might be slightly overweight. But just giving encouraging noises about when you examine the child rather than going, “Oh I am a bit worried about this; or a bit worried about that.”

The other thing that is quite helpful for is to look for loading. So loading of the sigmoid rectum. Often when you push in the left iliac fossa you might stimulate some of the pain. That is quite helpful because that also potentially gives you a sort of treatable etiology. If this is a bit like constipation you can treat the constipation and then that gives the young person some way of dealing with the pain and rationalising the pain.

Diane: So how would you manage children with recurrent abdominal pain?

Ian: I think the most important thing is firstly I need to assure myself that there is nothing serious going on. Then secondly I need to assure the family and young person that there is nothing serious going on. Now it is a very difficult message. Unfortunately, you have got to be very
careful how you deliver it. So if you say, “You have got terrible pain in your tummy but there is nothing serious going on,” that is scary. That means you are medically unexplained. That means that, “Oh my God; even the doctors can’t figure out what is going on with my tummy.”

So what I say there is, “You know the good news is that I haven’t found anything that is a scary explanation.” I explain that I am pretty good at finding scary explanations for people’s tummy. “But the difficulty is now what we have got to do is figure out how to – for you to manage the pain. So you are in charge of the pain and not it being in charge of you.” Then we talk about various different mechanisms for, “How are we going to make sure that you are able to stay in school? If you are at school and you get the pain, how are we going to make sure that the school doesn’t keep on phoning your mum for you to come home? How are we going to make sure that you go out to the cinema with your mates, with the pain and so on,” things like that.

In recurrent abdominal pain there are various different ways of managing the pain with analgesia. For example if the pain is particularly spasmodic you can use pain relievers like Mebeverine. Alternatively I would use simple analgesia. As long as this isn’t being used all day every day for weeks and weeks, that is almost always safe.

Diane: Okay so let’s move on to another common condition, vomiting.

Ian: Excellent.

Diane: What are the causes in newborns and infants?

Ian: So the causes of vomiting in newborns and infants is another list as long as your arm. I guess in terms of patients that I actually see then
probably the most common is being overfed. So basically parents have got a mismatch between the amount that they think the child should be taking or the frequency that the child is taking feeds and the actual amount that they should have.

There is the ubiquitous gastroesophageal reflux; so infants have got a rubbish valve between their oesophagus and their stomach. They have got big tummies; they lie flat all the time and therefore food comes up all the time. So that is extremely common and probably over-medicalised.

Then there is other things that can cause you to have vomiting associated with other illnesses. So for example if you cough a lot and you also have a little bit of reflux, then you are going to tend to vomit. More serious and worrying conditions would include pylorostenosis or other small bowel obstructions. Then it can be a non specific feature in pretty much any acutely unwell child. So for example a child presenting with a meningitis aged one week or two week; their initial presentation may just be with vomiting.

In older children I would generally think more in terms of well the acute stuff would be around gastroenteritis or diarrhoea and vomiting type illnesses. There can be other causes; so some children will tend to vomit when they have got a migraine for example. There are rarer causes; there are some children who obviously have the same range of illnesses as adults. So you can see bulimia but that is pretty rare. Obviously there are neurological causes for having increased vomiting. So conditions like raised intracranial pressure, but that is pretty unusual to see that.

Diane: What are you looking for in the history?

Ian: So the things that would worry me would be vomiting blood or vomiting green stuff. So green stuff would make me think that the child has got some sort of small bowel obstruction, ie bile. Now I think just a
point about that. There are a couple of things here that people will use the wrong words for.

It has been a while since I saw a child where the vomiting wasn’t described as bile, and where the child didn’t have “projectile vomiting”. That is fine; people use words wrongly but I think in medicine we need to be quite careful about that. So bile is dark green, it is not the yellowy stuff that somebody might vomit up after a particularly riotous night on the town. So it is a dark green; it means that you have got some sort of lower GI obstruction.

Similarly projectile vomiting – projectile means that if they are sitting on the mum’s lap then they can clear their own chin and probably hit the wall a few feet away without touching anything else in between. It is not just vigorous vomiting.

Then I would be just after other things in the history about, “Have they got any diarrhoea? Have they got any fever?” Is there anything else going on?

Diane: So what are we looking for in the history with older children?

Ian: I would be looking for precipitation of the vomiting; if there is any particular pattern to it. Yes, those sorts of things really.

Diane: Examinations - what would you look for in the examination?

Ian: Well my primary assessment in a vomiting child is whether or not they have become dehydrated. So for me that means looking at their mouth to make sure the mouth is not dry. Also a general assessment of their hydration status. I think it is worth again coming back to the NICE guidance for diarrhoea and vomiting which has got a good list of
things that describe when a child is dehydrated or not. So they have got a series of red flag features as well. So for example the child who is becoming unresponsive is of course a lot more unwell. They are clearly drifting into a shock.

Diane: In primary care, what sort of investigations should GPs be performing?

Ian: Well I think that is also still part of the examination. So for example a thorough examination assuring yourself that there doesn’t appear to be any sort of obvious abdominal pathology. It is surprising how difficult it is to fill a pyloric stenosis. So we are talking about – I think it is very badly named, pyloric tumour; basically the swelling of the pyloris, but it never surprises me how well surgeons can feel the pyloris after the ultrasound scan has demonstrated it. I can never feel it before, certainly myself.

I think that if you have anything that suggests that the child has got a non-abdominal cause for vomiting, you probably ought to think about having a look at the back of the eyes and seeing if there is any purple oedema; other features of neurological difficulty so any meninges and any raised blood pressure, etc.

Diane: So let’s move on to a condition that we have touched on briefly already, dehydration. Why is it important that GPs can recognise this in primary care?

Ian: Well the main importance is when it is getting worse. So for example as dehydration increases in severity that can place the child at risk of harm. So obviously as you know shock is where you begin shutting down bits of you, in order to preserve essentially the last thing that you want to preserve, is blood flow to the brain. So if you have not got enough blood to go elsewhere then you are in trouble. So it is making sure that the child can safely be recognised if that is beginning to
happen and then safely retrieved from that.

Diane: What are the common causes?

Ian: Mostly it would be diarrhoea and vomiting. Rarely you would see it after a burn or surgery; they would be pretty obvious. You might see it in the context of other illnesses like diabetic ketoacidosis or other situations where there is a polyurea. For example, diabetes mellitus or diabetes insipidus, but they are extraordinarily rare. You do from time to time see it in children who have got very painful swallowing.

So for example children who have got a terrible herpes stomatitis or a really nasty tonsillitis and they simply won’t drink. I have seen some children become quite spectacularly dehydrated as a consequence of that.

Diane: So let’s take a case example. A mother brings in her three month old baby daughter. She said she has had the runs for about 24 hours. What would you be thinking about with this type of history?

Ian: Okay, so I am after some past medical history to make sure that the baby has been fine previously. I am after the sort of nature of the vomiting. Well let’s assume they are vomiting. After the nature of the poo, what it looks like; how many there were. The number of wet nappies is going to be interesting. That could be difficult because the poo is going to get all mixed up with the wee. But basically if the baby is passing reasonable amounts of urine then they are not dehydrated.

The usual thing that I would say to families is that if their baby is having three or four wet nappies in 24 hours then that is completely reasonable. Of course it needs to be recognised that modern disposable nappies can absorb something like 4 or 500% their own
weight in urine, so it can actually be quite difficult to detect how wet nappies have become.

Diane: In the examination, anything that we should be specifically looking for?

Ian: Well you have got a fantastic weapon here; or a fantastic adjunct. That is the Red Book. If you reach for the Red Book, obviously there are differences in scales; if you look at the Red Book and they were a kilo heavier a week ago in the health visitor, then you have got a good indication of the fact that they have lost some significant amount of weight.

Diane: How would you treat children like this?

Ian: I would advise listeners to have a look at the NICE guide. So basically we used to spend a lot of time calculating the precise amount that we thought that children were dehydrated, and working out quite complex sums. We used to be quite aggressive about putting them on IV fluids. NICE guidance is much more aimed around including mild to moderate dehydration; anything short of shock using quite aggressive resuscitation with oral rehydration therapy. For example, they are looking at using volumes of 50 mls per kilo, over the four hours of oral rehydration solution, which is probably quite a step change for some people. It is quite a difficult thing to get your head around. I think clinically being a secondary care doctor I want to get an IV in and fill them up with fluid, but actually we try much more to use the enteral route these days in order to maintain hydration.

Diane: So let’s take another case example. A mother brings in her two year old daughter who has always had runny stool, is intermittent, but the
mum has never thought to do anything about it, until a friend advised her that it wasn’t normal. What would be your first thoughts with this history?

Ian: Well my first thought is to change her friend potentially. I mean is it a problem? We don’t want to medicalise non-medical problems. What is runny stool and what is diarrhoea? So we have got to decide, “Is this a significant problem?” If this child has got genuine runny stools that leak down the sides of the leg out of the nappy that is different to if they just go three or four times a day; that is probably not pathological.

So if they are having quite a lot of poo I would be thinking, “Well is this some sort of a chronic or recurrent diarrhoea?” There is a lot of talk about things like toddler diarrhoea, where classically children pass undigested food. So one of the trigger questions for me would be, “Do you ever see undigested food in the stool?” The family go, “Oh yes we can see sweet corn in there, or peas,” or whatever. That is usually pretty reassuring.

Obviously you have got to think also about malabsorption. So for example children who don’t have the right enzymic processes to be able to absorb the food. So children who have conditions like cystic fibrosis, who lack certain enzymes. There are conditions like celiac disease, which you can think of as probably being a bit like a chronic inflammatory problem to a food stuff. There are conditions like lactose intolerance, where you are effectively getting an osmotic diarrhoea so the water is held in the poo because of your failure to absorb certain of the carbohydrates in your poo.

Rarer there are things like the inflammatory diseases; so Crohn’s Disease or ulcerative colitis. I mean I would hope that this mother of this two year old would probably have noticed that their child was pretty unwell. I mean it is unusual to present at two years old with a genuine inflammatory bowel disease. There are conditions like cow’s milk protein intolerance which people argue endlessly about; whether it is a genuine cow’s milk protein intolerance or a cow’s milk allergy, or
various different classifications. Then of course there are possible chronic infections, but this child should be a lot more unwell if they have had infections.

Diane: So in terms of the history, what should GPs be asking about?

Ian: I think it is back again to whose problem is this? Is this really just actually a problem for the child? Or is this child genuinely unwell with this? Are there any other factors? For example does this happen every morning, every evening? Does it happen after they have a certain sort of food? Had they tried any food restrictions? Then when they reintroduced the food it came back again. If they did try a food restriction how pure was that?

So for example I have met families who say, “Oh yes we tried cutting out milk, doctor.” I say, “Well tell me the sort of things you gave?” They talk about they gave yoghurt and you think, “Yes but yoghurt is a milk product.” So if they did try a restriction was it efficient? Was it a true restriction? In addition the real thing that I would be worried about would be weight loss.

Diane: So what would you be looking for in the examination?

Ian: Well again to sort of echo that last point is that I would be interested in the child’s growth. So the issue is, “Is this child’s gut functioning in a way that allows them to get sufficient nutrition to grow?” If it is, a very rough rule of thumb, that child is usually okay. So are they getting taller? Are they getting heavier?

Then it would be looking for, “Do they have anything else that might suggest chronic disease pattern?” So if they have got a classic clubbing or whatever, secondary to some sort of chronic gut disease
or chronic lung disease, extraordinarily unlikely in the 21st century in the UK. If they have got a tender abdomen, that would imply more of an acute process or an inflammatory process. I would be quite worried about that.

I would have a look at the bottom. But certainly as a paediatrician I would be very reluctant to do a rectal examination. I would usually leave that to a surgeon, or somebody who genuinely felt it necessary to do it; certainly if the bottom is at all sore then I wouldn’t want to submit the child to that.

Diane: Would you consider investigations? What would they be?

Ian: If the child is thriving and appears to be on a relatively normal diet, no I wouldn’t. If the child is not thriving then I would try to focus my investigations on what was going on. So if they have got explosive, offensive stools, I would be thinking, “Well do I need to look at the stools? Do we need to look for ova cyst parasites etc?” “If their stools are terrible to flush do I need to think about celiac disease?” I would do blood tests for those.

“If the child has got other symptoms do I need to look for urinary tract infection? Do I need to think about doing other imaging of the gut?” Those would definitely be secondary or third line. In particular one of the tests that quite a lot of people do I find less than entirely useful. So a lot of people do reducing sugars in the stool. Basically, the presence of reducing sugar in the stool – and reducing sugar is basically a disaccharide; the presence of it means that you are having problem absorbing your disaccharides, ie you have got a lactose intolerance.

So that can be a useful test; but if you have got a family that say, “Every time we give him a pint of milk he gets diarrhoea,” I am not sure that you need to send them chasing up the poo and putting it in a pot, putting it in the lab and doing this test. First time it comes back and says, “The pot leaked and we won’t analyse this,” and so on.
So I think you need to just be sort of sensible about actually how far, how hard you go in with your investigations.

Diane: Okay so let’s move on to our final case example: the father brings a three year old boy to see you. He said he hasn’t opened his bowels for the last four days and he has just not been himself. What would you be thinking about initially in this sort of situation?

Ian: I am assuming we are just describing constipation? I am assuming that this isn’t a first time he has been four days. But usually what you would find is that that is a sort of a longstanding history that has been a couple of times – a couple of weeks or a couple of months, where he has been having increasing difficulties passing poos.

Diane: What are the causes of constipation?

Ian: Well mostly it is idiopathic, meaning there isn’t specific cause. It might be secondary to a minor illness where the child has got a bit hot; got a bit dehydrated, the poo became a bit hard. But then it becomes a sort of a self-fulfilling prophecy. The colon just absorbs more water; the longer the time the poo is in the colon the more water it absorbs. So the poo gets harder, so the child gets more constipated and so on. So you just get into this vicious cycle. There are a whole bunch of more serious causes.

So for example there is a condition called Hirschsprung’s Disease which means that your bowel isn’t quite properly put together. In fact, the neurology of your bowel isn’t quite right. So basically you haven’t got any neurones into your bowel, so it doesn’t peristalses properly. That is very rare and is usually associated with pretty bad constipation right from birth; it wouldn’t be presenting usually in a three year old.
But it is an important feature of the history; you should always ask, “How old was he when he had his first poo?”

Diane: Are there any other things that GPs should be asking about in the history?

Ian: I think it is important to get a feel for how longstanding the problem is; whether there are any particular behaviours that have begun to emerge around the poo. So for example let’s say this child is going every four days. But for the 24 hours before he is about to poo the Dad might say, “Well he is really straining to go for that 24 hours, doctor.” Actually if you ask really carefully you will find that he is actually straining to hold on to the poo. He is kind of stool holding. The child might go and sweat and sweat and stand behind the curtains and hold on to that poo. So it is all those sorts of behaviours around the poo and beginning to unpick those. So the parents really understand that actually this child had figured out that pooing is painful and is trying to work against his body in order to hold on to the poo.

Diane: In an examination what should you be looking for specifically?

Ian: So the main parts of the examination are to exclude significant pathology. So you are looking to check that the child is growing okay. So height, weight, does the child appear normally grown. But you are going to examine the abdomen to make sure that you have not missed any significant pathology. Something that is quite helpful and quite a powerful message is to find some poo and press on it in the abdomen. Certainly in the lower left side. If you are able to then demonstrate that to the parents; let them feel it. They go, “Oh gosh, there are rocks there.” That is quite helpful.
The other important thing is just to make sure that the spine looks okay. So other rare causes would include some sort of spinal dysraphism, or occult spina bifida; some sort of nervous abnormality, innovation abnormality of the anus. So for example I would always look at the spine; I would check down the spine and make sure that there are no tufts of hair; make sure there doesn't appear to be any abnormality there. Make sure that the anus isn’t – patulous, it isn’t just gaping at me, that it is a tight anus that looks like it is able to close as well.

That can be a bit difficult because of course if you have got quite a constipated child and it is a small child and they are just about to open their bowels, then they might have a slightly open anus. But I think you should be able to familiarise yourself with how a child’s anus looks; and be clear that, “Actually this anus looks like it is wired okay.”

Diane: Would you ever consider doing any investigations?

Ian: Only in severe intractable constipation. But I think there is no such thing as a routine investigation. For example if I got a strong history that the child hadn’t pooped in their first 24 hours of life I would refer to a surgeon for a rectal biopsy. If I thought that there could be some sort of spinal abnormality I would refer for an MRI scan of the spine. So those are kind of – those are two really quite serious pieces of investigation and I don’t do them lightly at all.

Diane: So how would you manage these children?

Ian: So our management of constipation has been revolutionised really over the last few years. Firstly there is excellent NICE guidance which was published in May 2010 called “Constipation in Children and
“Young People”. Partly what this has done is it has gone to over BNFC, BNF For Children, doses of the medicines that we were previously using. So we are allowed to be a lot more generous than it says in the BNFC.

The other major revolution is us being much more liberal with the macrogols. So that is polyethylene glycol which is an osmotic diuretic that stays in the gut; holds water in the gut and makes it much more easy to poo.

Lots of families are very, very comfortable with using this because they can mix it with any sort of drink. I have had a family recently who put it in an ice cube and their child would take it in an ice cube. I don’t know if the manufacturer technically allows or suggests this; but there is a whole range of ways that you can use this good medicine. So what we do is we use rapidly increasing doses in order to disimpact the child. Then we move on to using maintenance and warning parents that it can take a significant amount of time for the constipation to eventually recover.

Diane: So any final comments about common abdominal problems in childhood?

Ian: So I think the three things that I would be trying to get across is firstly making sure that what we say and what parents say might be different. So for example when a parent says, “Oh he has got projectile vomiting,” we need to be clear that we are talking the same language. It is fine for parents to say that; but when we talk medically to each other, we need to know what we mean by projectile vomiting.

The second thing that I want to emphasise is the increasing emphasis on the use of the oral route for rehydration and dehydration. I think that is a revolution; it is very important. It is where we are really learning from the developing world who are years’ ahead of us on this.
The last thing I wanted to emphasise is the generosity with which we should be using laxatives in constipation. It is a shocking disease; it is unpleasant. Families completely re-engineer themselves around the child with the constipation. We should be generous with the medicines; we should use them liberally. Remind families that it is okay to be on these medicines for some time. It won't harm their child. It actually improves their child’s chances of a full recovery.

Diane: Many thanks to Dr Ian Wacogne. For other episodes in the series, and further useful resources, follow the links on the next page.

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