

education

FROM THE JOURNALS Edited highlights of Richard Lehman's blog on <http://bmj.co/Lehman>

Unhappily delirious

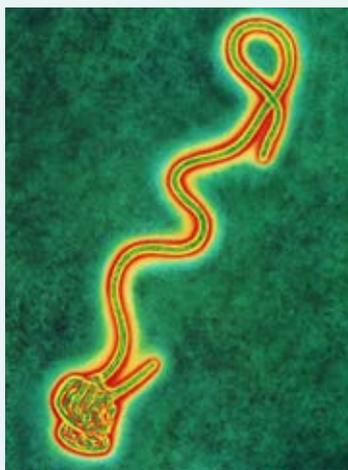
My father in law was the most rational of men. He enjoyed a pint at the golf club twice a week but otherwise seldom drank alcohol. But after a very protracted vascular procedure at the age of 80 he didn't recognise that he was on a surgical ward and rambled incessantly. The staff seemed scandalised and put it down to alcohol withdrawal. Whatever basic surgical nursing training they had received, it seems they had never been told that "delirium is the most common surgical complication among older adults, with an incidence of 15% to 25% after major elective surgery and 50% after high risk procedures such as hip fracture repair and cardiac surgery." Here's a clinical review of the subject that I would like to recommend, but it too tends to wander and fails to recognise its audience, and I'm left without any clear take home messages for the people who deal with confused people in hospital beds. Except not to blame the patient, but look for a treatable cause, and avoid sedating drugs.

• *N Engl J Med* doi:10.1056/NEJMcp1605501

Precisely, what is precision medicine?

"Precision medicine describes prevention, diagnosis, and treatment strategies that take individual variability into account. While precision medicine aims to incorporate individual variability in genes, environment, and lifestyle, the emphasis in current practice is on personalised genetic profiling for diagnosis and risk assessment." So begins a Viewpoint which is open access and worth reading. It might even be worth your while to print it and cover it with comments in red ink. Yours will probably be different from mine, which would be longer than the article itself. If you think medicine is messy now, just you wait till it becomes "precise."

• *JAMA* doi:10.1001/jama.2017.11914



How to PREVAIL against Ebola

The West African Ebola outbreak was a lesson in all sorts of things. One was how to develop and test a vaccine during an epidemic. This got as far as phase 2 for two different vaccines: a chimpanzee adenovirus 3 vaccine and a recombinant vesicular stomatitis virus vaccine. Happily, the Ebola virus epidemic ended before phase 3 was reached. But the PREVAIL trials had time to show that by one month after vaccination, the vaccines had elicited immune responses, and these were largely maintained through 12 months.

• *Lancet* doi:10.1016/S0140-6736(17)32092-5

• *N Engl J Med* doi: 10.1056/NEJMoa1614067

Hormone tests don't predict fertility in premenopause

Antimüllerian hormone, or Müllerian-inhibiting hormone, is supposed to be a measure of "ovarian reserve," and is a test offered by lots of fertility clinics. Here's a study of nearly a thousand women from North Carolina without a history of infertility who were trying to conceive. They had blood and urinary measurements of follicle stimulating hormone and inhibin B.

None of these bore any relation to success in conceiving over the following years. But I bet you that in 10 years' time they will still be offered by most private fertility clinics.

• *JAMA* doi:10.1001/jama.2017.14588

Pre-hypertensive primary aldosteronism

About 15 years ago, I thought it would be a good idea to look for hyperaldosteronism in people with persistently elevated blood pressure in primary care. But after talking to lots of people and reading lots of papers, I concluded that it was logistically impossible, and might lead to over diagnosis with no patient benefit. No such qualms seem to trouble the authors of this study, which uncovered a new syndrome of "subclinical primary aldosteronism" by taking measurements of plasma renin activity and serum aldosterone in a cohort of normotensive patients. Those with high aldosterone and suppressed renin were at higher risk of developing elevated blood pressure over subsequent years. In other words, they were at higher risk of acquiring a risk factor, so fulfilling the rules that govern the strange world of cautionary over diagnosis.

• *Ann Intern Med* doi:10.7326/M17-0882

Death from hypersedentarianism

Maybe a few people die from undetected hyperaldosteronism, but I think it's certain that tens of millions die from overt hypersedentarianism. But I can't prove it: I can only infer it from observational studies like this one. Even in a cohort of 8000 followed for four years, the association between sitting time and mortality only just reached statistical significance. Yet taken with all the other evidence, the case against spending most of your life sitting is incontrovertible.

• *Ann Intern Med* doi:10.7326/M17-0212

Postoperative management of shoulder, hip, or knee arthroplasty

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The number of orthopaedic operations is increasing in the UK: the National Joint Registry reported 225 000 procedures in the period ending 2015-16.¹

Arthroplasty—what's changed?

In 2015 in the UK 83 000 primary total hip replacements took place, and 4200 shoulder arthroplasties were performed.¹ Enhanced recovery programmes have seen better standardisation of arthroplasty care and are now fully implemented in the NHS. They have been shown to reduce mortality, length of hospital stay, and transfusion requirements.² They have four main steps, summarised in the box below.

Wound care

A meta-analysis of six mainly small and poor quality studies assessing wound closure methods reported that skin staples and nylon sutures are the most commonly used materials for closing orthopaedic surgical wounds.³ Staples are metallic and nylon is a



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WHAT YOU NEED TO KNOW

- Do not treat suspected wound infections empirically with antibiotics without advice from the operating surgeon, as it may diminish the ability to later isolate an organism to treat
- Patients should refrain from driving for a minimum of six weeks after surgery
- Use NSAIDs with caution because of their potential adverse effects on osseointegration
- Postoperative physiotherapy and rehabilitation are extremely important for long term function and avoidance of complications

non-absorbable suture, both forms of closure must be removed. By the 10th postoperative day, the wound should have sufficiently healed.³

Prolonged ooze is a risk factor for an infected joint⁴ and should have ceased by the third or fourth day postoperatively. Risk factors for continued ooze include diabetes, obesity, and the use of anticoagulation. If a wound is still oozing or slightly dehiscd by day 10, there may well be an underlying problem that requires surgical intervention. Refer these patients urgently to the operating surgeon.

Sometimes absorbable sutures may be used, and they will often have tags left at either wound edge. Cut the suture flush to the skin after 10-16 days. Keep wounds covered until the scar has fully healed and the sutures removed.

Prosthetic joint infections

Prosthetic joint infections are a serious complication of arthroplasty surgery, and incidence hovers at the 1% mark (fig 1).¹ Infections are broadly categorised into acute (within 3-6 weeks postoperative) and chronic (after 6 weeks).

Occasionally patients may present in florid sepsis with pus draining from the wound. Often, however, patients may have subtle signs, including ongoing pain, slight erythema, or wound ooze. Distinguishing a superficial infection from a deep infection is difficult, even for the most experienced, and joint aspiration under aseptic conditions is often necessary. Err on the side of caution and refer patients who present with a suspected infection to their surgeon for an opinion. Do not prescribe empirical antibiotics before establishing a responsible pathogen as this can complicate treatment.

Enhanced recovery programme steps

Step 1. Improve preoperative care

- Patient education, such as joint schools
- Anaesthetic preoperative evaluation

Step 2. Reduce the physical stress of the operation

- Standardised care, team approach, staff training
- Standardised surgical technique
- Standardised anaesthetic with emphasis on "single shot" spinal anaesthetic rather than general anaesthetic
- Use of multimodal analgesia, including intraoperative infiltration of deep tissue
- Standardised perioperative dose of antibiotics (postoperative doses are falling out of favour)
- Avoid the use of a catheter
- Minimised fasting time and enhanced nutrition

Step 3. Decreasing postoperative discomfort

- Standardised analgesia
- Use of a designated ward, physiotherapists, and nursing staff
- Enhanced fluid balance and nutritional care
- Promotion of wellness

Step 4. Improving postoperative mobility and follow-up

- Designated team aiming to mobilise the patient on day 0 or day 1
- Early discharge with clear instructions and multidisciplinary support
- Discharge with adequate pain control and standardised analgesia for home pain control
- Follow-up in six weeks to ensure adequate progress
- Further review after one year

The first 20 weeks after joint replacement surgery

Postoperative rehabilitation and physiotherapy are beneficial after knee, hip, and shoulder arthroplasty. It is increasingly conducted in the community because of the short postoperative length of stay. There are, however, a number of restrictions for patients in the weeks following an operation.

- H THR (total hip replacement)
 - K TKR (total knee replacement)
 - S TSR (total shoulder replacement)
- } A All



✓

Encourage

- A Swimming
- A Golf
- H K Aerobics
- H K Dancing
- H K Gentle walking
- S Walking or hiking
- S Cycling
- S Light tennis

✗

Advise against

- A Contact sports
- H K Heavy labour
- H K Sports requiring twisting
- H K Impact exercises
- H K Running
- K Sitting cross legged
- K Kneeling
- S Sports requiring throwing or similar motions

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Postoperative restrictions and rehabilitation

Postoperative rehabilitation and physiotherapy are beneficial for knee,^{6,7} hip,⁷ and shoulder⁸ arthroplasty. They are increasingly conducted in the community because of the short postoperative length of stay. Ensure patients are not lost to follow-up.

Total hip replacement

Restrictions

- Instability and dislocation pose serious risks after total hip replacement (fig 2). We recommend that restrictions are adhered to unless the surgeon instructs to the contrary.
- Dislocation can be an orthopaedic emergency as the dislocated head can put significant pressure on the sciatic nerve. Patients will feel a pop, and their leg will appear short and rotated. They tend to be in considerable pain and are unable to walk, and normally present straight to an emergency department.

Total knee replacement

Restrictions

- Patients should avoid kneeling or sitting cross legged, particularly for the first six weeks after knee replacement (fig 3).

Total shoulder replacement

Restrictions

- For the first six weeks after shoulder replacement, patients should keep their arm in a sling. The arm should not fall to rest from beyond the midline of the body and should not be put behind the patient's back.
- There should be no resisted internal rotation, such as shutting a door or pulling the cord of a blind.
- Patients should avoid heavy lifting for six months. Contact activities should be avoided where possible.

What activities should I recommend to patients?

Counsel patients before their treatment that arthroplasty aims to improve their pain and quality of life but does not aim to restore their joint to a pre-morbid state.

Activity modification has two main functions: to ensure acute damage is not caused to implants and to promote longevity, as implant survival is related to use rather than time.¹² Younger patients with increasing expectations are likely to cyclically load their implants more than older patients, increasing the risk of wear and loosening and subsequent need for revision. Advise patients to modify their lifestyle accordingly, and indefinitely.

Discourage patients with a total hip or knee replacement from participating in activities such as:

- Running
- Impact exercises
- Contact sports
- Sports requiring twisting, such as:
 - Basketball
 - Heavy labour.

Promote activities such as:
Swimming



Fig 3 | Anteroposterior x ray of a total knee replacement showing a periprosthetic fracture



Fig 1 | X ray of pelvis showing a chronic infection of a total hip replacement with protrusio acetabuli



Fig 2 | X ray of pelvis showing a dislocated left total hip replacement

Gentle walking
Dancing.

Discourage patients with shoulder replacement to refrain from participating in:

- Sports requiring throwing motions, such as tennis
- Activities with similar movement, such as hammering
- Activities that risk patients falling onto outstretched arms, such as contact sports.

Promote activities such as

- Walking and hiking
- Cycling
- Swimming.

What complications commonly present to primary care?

The infographic summarises the main postoperative complications of arthroplasty and the precautions that can be taken.

Venous thromboembolism

Venous thromboembolism encompasses both deep vein thrombosis and pulmonary embolisms. Deep vein thromboses are common after lower limb arthroplasty, particularly total knee replacement. A large, well conducted, prospective Australian study

reported asymptomatic deep vein thrombosis rates of 25% for unilateral knee replacement and 36.9% for bilateral knee replacement, whereas the rate for total hip replacement was only 8.9%. This was despite chemical and physical thromboprophylaxis.¹³ The rate of equivalent asymptomatic deep vein thrombosis after shoulder arthroplasty was found to be about 13% in one prospective study.¹⁴

The rate of symptomatic deep vein thrombosis is much lower. A large retrospective analysis of hospital admissions databases in New York assessed over 328 000 patient codes for the presence of deep vein thrombosis after arthroplasty. They describe a rate of 5.0 per 1000 procedures for shoulder arthroplasty, compared with 15.7 for hip and 26.9 for knee arthroplasties.¹⁵

Diagnosing and deciding on treatment for deep vein thromboses poses a challenge: pain and swelling may be a result of normal postoperative changes rather than a deep vein thrombosis. If there is any concern, refer patients to their local venous thromboembolism services or, in the presence of breathing difficulties or chest pain, to an emergency department.

Neurovascular deficit

Nerve or vessel damage after arthroplasty surgery is rare¹⁶⁻¹⁸ and tends to be picked up postoperatively before discharge. A numb area of skin lateral to a total knee replacement incision is common, with some series reporting an element of hypoesthesia in all patients.¹⁹ The cause of this numbness is an injury to the infrapatellar branch of the saphenous nerve. Reassure patients that symptoms improve in most cases.¹⁹

What medication should I prescribe?

Analgesia

Patients will regularly require paracetamol or weak opioids (such as codeine) for the first 4-6 postoperative weeks. Ongoing pain thereafter, particularly if at night, may need to be investigated as it may be due to component malpositioning or infection. In such cases, check inflammatory markers and request an x ray to be reviewed by an orthopaedic surgeon. It is important that patients prevent pain as well as treat it: taking pain killers before physiotherapy sessions, for example, is a good way of ensuring painful exercises are more closely adhered to. Treating adverse effects of pain killers (such as constipation) should not differ from routine practice.

The use of non-steroidal anti-inflammatory drugs (NSAIDs) has been controversial. Some studies suggest an inhibition of bone healing after NSAID use, which poses a question about their safety after uncemented arthroplasty, which relies on osseous integration.²⁰ A 10 year follow-up of a cohort of Swedish patients showed an increased rate of revision of total hip replacements among those treated with ibuprofen.²² We advise general practitioners not to prescribe NSAIDs unless other routine analgesics have failed, particularly in the case of uncemented implants.

NSAIDs should not be prescribed unless other routine analgesics have failed

HOW WERE PATIENTS INVOLVED?

Five arthroplasty patients were asked at follow-up what common questions remained unanswered during their rehabilitation, and what led to concern. Travel, driving, and return to work featured regularly, as did how to manage troublesome wounds.

EDUCATION INTO PRACTICE

- Based on the recommendations in this article, have you been appropriately highlighting and treating oozing wounds?
- Does this article equip you with the necessary information to inform patients regarding driving, travel, and return to work?
- Are you familiar with postoperative restrictions and precautions after joint replacements?

Venous thromboembolism prophylaxis

The National Institute for Health and Care Excellence (NICE) recommends:

- 28-35 days for THR
- 10-14 days after TKR

There is no clear evidence to say which type of pharmacological prophylaxis is best, and individual units or surgeons may have a preference. The British Hip Society (BHS) supports the use of aspirin.²⁴ The British Elbow and Shoulder Society (BESS) reports only a moderate risk of venous thromboembolism and recommends the use of mechanical prophylaxis alone.²⁵

Return to work

A Dutch study identified a large variation in return to work after hip and knee replacements (1.1-13.9 weeks for total hip replacement and 8.0-12.0 weeks for total knee replacement).³⁰ Return to work after total shoulder replacement is more dependent on occupation. One study reported almost 20% of patients had to change their occupation because of a shoulder replacement.³¹

Road to recovery

When is it safe to drive?

This is dependent on the arthroplasty. Patients should be allowed to drive only if they can apply an emergency brake. Most organisations recommend a minimum of six weeks before driving for all joint replacements. Ensure that patients have informed the Driver and Vehicle Licensing Agency (DVLA) and their insurance company.²⁹

Air travel

The risk of venous thromboembolism associated with air travel has been extensively investigated and has been shown to be associated with the duration of travel (long haul flights) and with multiple flights in a short time.³²

Make patients with joint replacements aware of the increased risk of activating security alarms in airports, and being searched more thoroughly by security staff.³⁵⁻³⁷

Competing interests: SK has lectured for Stryker, Smith & Nephew, and AO UK but received no payment and on topics not relevant to this article.

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Management of paediatric hernia

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This is an edited version; the full version is on bmj.com

A hernia is the protrusion of an organ, such as the bowel, through the wall of the cavity in which it normally resides.¹ Paediatric hernias are common developmental abnormalities that have different management from their adult equivalents. Conducting research in the management of paediatric hernias is challenging because of ethical considerations and variations in treatment practice.

Umbilical hernia

Umbilical hernia affects an estimated 10-30% of all white children at birth, reducing to 2-10% at one year.^{2,3} Rates in the African population have been estimated at 23-85%.⁴⁻⁶ The exact aetiology predisposing African populations at increased risk is unknown.^{4,7}

The umbilical ring exists to allow passage of vessels through the abdominal wall muscles between mother and fetus. After birth the ring closes. A failure or delay in this process leads to the formation of an umbilical hernia.

Umbilical hernias present as a reducible, painless bulge at the umbilicus. They usually become more prominent when the patient strains or cries. Parents might present with anxiety about the appearance of a lump when their child is upset or unwell. Distress and crying cause an umbilical hernia to protrude more because of increased intra-abdominal pressure. If the hernia is still reducible this does not indicate a complication.

What to look out for

A literature review that includes studies of varying size and quality from several countries in 1998 reported a complication rate of 1:1500.¹⁰

Incarceration occurs when abdominal viscera or omentum become stuck within the hernia. Strangulation occurs when viscera become stuck in the hernia with compromise to their blood supply, causing ischaemia. Children with incarcerated hernias present with painful irreducible lumps that can change colour and when strangulated are associated with vomiting or constipation.

What you should do

Take a thorough history and perform a systematic examination to ensure the umbilical hernia is the primary problem. Sometimes the appearance of an



0.5 HOURS



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umbilical hernia is secondary to an unrelated condition, causing the child to be in distress and cry.

Patients with symptoms of incarceration or strangulation need urgent assessment and referral as an emergency to the paediatric or general surgical team.

Reassure parents of children with asymptomatic umbilical hernias that complications are rare, and that most hernias close spontaneously by the child's fourth year. Refer children over the age of 4 to a paediatric surgeon, as spontaneous closure is less likely as the child grows older.

What happens in secondary care?

The patient is seen and assessed by a surgeon. A discussion takes place over further conservative management versus surgery. Operative intervention might be offered on a routine day case basis if the child is older than 4, but practice varies locally.

Day case primary repair under general anaesthetic is the most common method of hernia repair. Some surgeons perform laparoscopic repair of umbilical hernias, although the benefits remain unclear. For open repair, one large long term observational study indicates a low morbidity and low recurrence rate.¹⁵ The type of repair offered depends on local circumstances and availability.

Postoperative complications

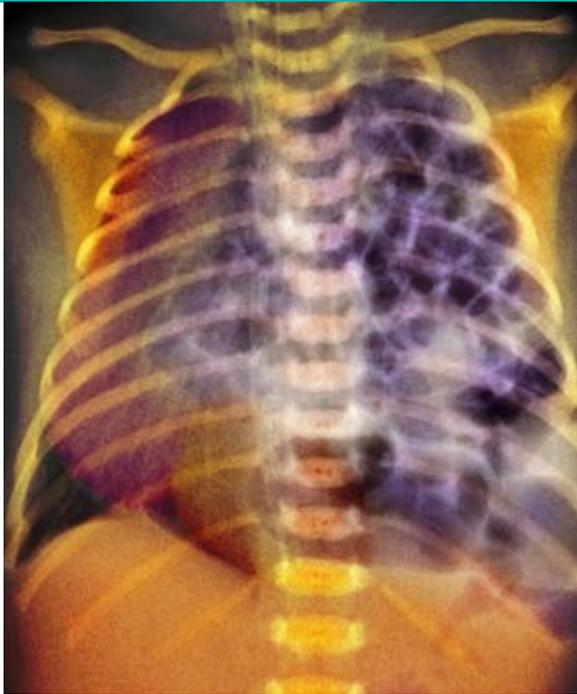
Specific complications are uncommon after open umbilical hernia repair. It is possible to injure small bowel or omentum within the hernia. Warn patients

Risk factors for paediatric hernia

	Umbilical hernia ⁸	Inguinal hernia
Risk factors	Prematurity Low birth weight Down's syndrome Beckwith-Wiedemann syndrome Ehlers-Danlos syndrome Hypothyroidism Children of African descent	Premature, low birthweight infants (<1 kg) (increased rates of up to 30% ⁶) 4× more common in: • males • patients with connective tissue disorders • patients with conditions that raise intra-abdominal pressure (eg, cystic fibrosis) ⁹

WHAT YOU NEED TO KNOW

- Reassure parents of children with asymptomatic umbilical hernias that complications are rare, and that most hernias close spontaneously by the child's fourth year
- Repair can be offered for epigastric hernias on a routine non-urgent basis, as this type of hernia will not resolve itself
- Inguinal hernias have a substantial risk of complication. Refer for specialist assessment and surgical intervention
- A unilateral tender, swollen, erythematous scrotum can be either a torted testis or an incarcerated hernia: both require urgent surgical referral



Radiograph of a newborn baby with a diaphragmatic hernia

about poor cosmesis, scarring, and recurrence. A large observational cohort study reported a 2% recurrence rate over 13 years.¹⁵

Patient/parent information

British Association of Paediatric Surgeons free umbilical hernia leaflet: <http://www.baps.org.uk/content/uploads/2013/03/Umbilical-Hernia-Repair-child.pdf>

Epigastric hernia

The true prevalence of epigastric hernia is unknown. In a small observational study from the US, epigastric hernias accounted for 4% of all paediatric abdominal wall hernia referrals.¹⁶

Epigastric hernias occur in the midline, anywhere from the xiphoid process to the umbilicus, and most contain preperitoneal fat. The underlying pathology is controversial; theories include failure of complete fusion of abdominal wall muscle fibres at the linea alba or defects at the sites of blood vessel penetration.^{17 18}

Children present with a mass in the epigastrium, which commonly enlarges and is associated with abdominal wall pain or tenderness. Nearly 10% of epigastric hernias have multiple defects, which present as multiple lumps in the midline. Additionally, many younger patients find that their hernias rub against clothes, leading to pain and irritation of the skin.¹⁶

What to look out for

Nearly two thirds of epigastric hernia are reducible.^{16 19} However, unlike umbilical hernias, epigastric hernias do not resolve themselves. There are no reports to date of bowel being strangulated in an epigastric hernia in children.

Do not confuse epigastric hernias with divarification of the recti, which is a weakness in the linea alba running down the midline from xiphisternum to umbilicus; this is

Epigastric hernia repair is a relatively minor procedure, which is well tolerated by children

not a hernia and divarification will resolve as abdominal wall musculature develops. Divarification is elicited as a uniform bulge in the midline when the supine patient raises their head off the bed.

What you should do

Refer all patients who present with epigastric hernias on a routine basis to secondary care for further assessment. Examine the area carefully to assess for multiple defects.

What happens in secondary care?

There is limited evidence to guide the management of epigastric hernias in secondary care. Most recommendations are extrapolated from adult epigastric hernias.¹⁶

Generally, repair is recommended on a routine elective day case basis under general anaesthetic for all children. Some centres will discuss taking a “wait and see” approach with parents of patients with asymptomatic epigastric hernia.¹⁶ Epigastric hernia repair is a relatively minor procedure, which is well tolerated by children. A small transverse incision is made over the hernia, which is then separated from the abdominal wall, the sac is reduced, and the defect closed with a suture. Children generally have thin abdominal walls, so they sometimes feel a suture present afterwards; most surgeons use sutures that dissolve over time.

Inguinal hernia

Inguinal hernias occur in 0.8% to 5% of full term infants with risk factors listed in table 1.⁷⁻²⁰

The processus vaginalis lengthens through the inguinal canal from the third to the seventh month in utero and allows the testes to descend into the scrotum. The processus vaginalis gradually obliterates at weeks 36-40 with just the distal portion persisting as the tunica vaginalis. Failure of closure of the processus vaginalis is a common mechanism in the pathogenesis of inguinal hernia and hydroceles in children. This enables intra-abdominal contents to herniate (see figure p 122).

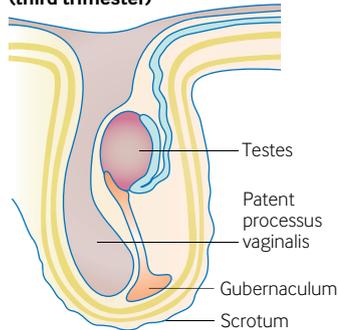
The left processus vaginalis obliterates before the right; this is thought to explain why right sided inguinal hernias outnumber left sided and bilateral hernias in a ratio of 7:2:1.²¹

A hernia usually presents as a bulge in the groin, although in boys it can present as a swelling within the scrotum, which is often visible only upon straining or crying. A hydrocele can also present as a swelling in the scrotum.

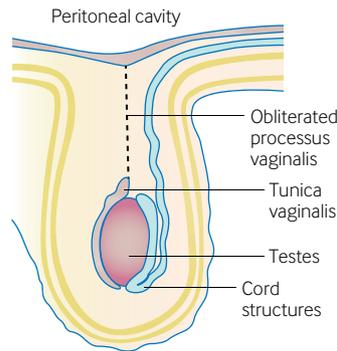
What to look out for

There is a 5-20% chance of developing a contralateral hernia in paediatric patients, so examine both sides.²² Parents should be made aware that following repair on one side, development of a hernia on the contralateral side can occur. Incarcerated hernias present as an irreducible lump in the groin. Most incarcerations occur in infants.^{23 24}

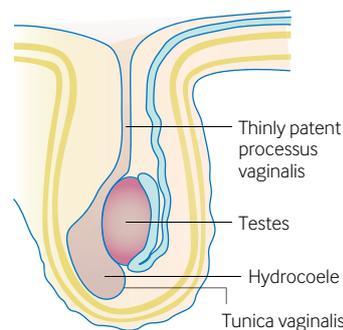
Normal testicular development: Inguinoscrotal descent (third trimester)



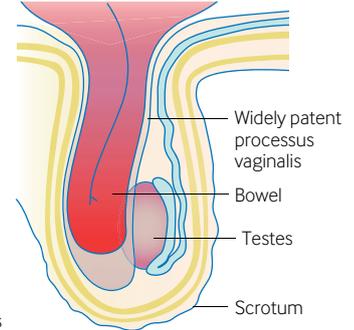
Normal testes



Hydrocoele



Inguinal hernia



SEARCH STRATEGY AND SELECTION CRITERIA

A search of Medline, Embase, and the Cochrane collaborative was performed using the keywords “umbilical,” “epigastric,” “inguinal,” “hernia,” “child,” “paediatric,” and “paediatric” to gather evidence and establish current recommendations. All articles were considered and no date range was specified, with 234 articles reviewed. Many of the data reviewed were case series, best expert opinion, and retrospective cohort studies. Many of the studies drew on evidence from adult hernias, extrapolating support of current management in the paediatric population. We consulted up-to-date national and international guidelines and the British Association of Paediatric Surgeons website for patient information.

A unilateral, swollen, erythematous labia can be a torted ovary, which has passed through a patent processus vaginalis; urgent surgery is indicated to save the ovary.

What you should do

Refer all young infant patients to secondary care, as the incidence of incarceration in infants ranges from 3 to 16% and can be up to 31% in premature infants in the first year of life.^{7,20} Older children with an asymptomatic inguinal hernia should be referred on a routine basis with the risk of incarceration decreasing with age. Caution should be applied with transillumination to differentiate between inguinal hernias and hydroceles as both can transilluminate with a pen torch in very young patients, especially neonates.

Fifteen percent of reduced incarcerated inguinal hernias re-incarcerate within five days

EDUCATION IN PRACTICE

- The British Association of Paediatric Surgeons offers free patient information leaflets regarding repair of umbilical and inguinal hernias. Ideally these should be given to parents at their initial consultation.
- How might you assess whether your practice was providing relevant information to patients?
- How might you assess whether appropriate referrals for paediatric hernias were being made to secondary care?

PATIENT INVOLVEMENT

We asked 23 patients (7 inguinal, 3 epigastric, and 13 umbilical hernia) and their parents in our paediatric surgery clinic which aspects of their child’s care could have been managed better, and which aspects were managed well. Specific attention was then given to any information the parents thought should have been given at the initial consultation in secondary care.

Use an index finger and thumb to palpate the lump superiorly. You will be able to get above a hydrocoele, while a hernia is continuous with the patent processus vaginalis.

If doubt exists then an ultrasound scan is a useful investigation to differentiate the two.

Refer patients who are exhibiting symptoms of strangulation as an emergency to secondary care.

What happens in secondary care?

Incarcerated or strangulated hernias

Attempts should be made to reduce the hernia in patients presenting with signs of incarceration; this is successful in 97-99.1% of cases.²⁵

Fifteen per cent of reduced incarcerated hernias will re-incarcerate within five days if not repaired, so discuss any patient presenting with incarceration or strangulation with the on-call paediatric surgical team urgently.^{7,25} They will assess how quickly the hernia needs to be repaired

Asymptomatic inguinal hernias

Asymptomatic inguinal hernias in neonates are operated on before discharge from the maternity unit. Children less than 6 months old are operated on the next available list, and older children as an elective case. Both laparoscopic and open repairs are offered, depending on local circumstances and resources.^{26,27}

Open herniotomy is performed through a small groin incision. After identifying the cord structures, they are carefully separated from the hernia sac. The sac is ligated proximally and any distal hydrocoele suctioned before closure.

All laparoscopic techniques attempt to place a purse string suture around the patent processus vaginalis.

The field is divided over whether open is better than laparoscopic surgery. Both are regarded as safe procedures.

Patient information

British Association of Paediatric Surgeons free inguinal hernia repair leaflet

- <http://www.baps.org.uk/content/uploads/2013/03/Inguinal-Hernia-Repair-child.pdf>

Competing interests: None declared.

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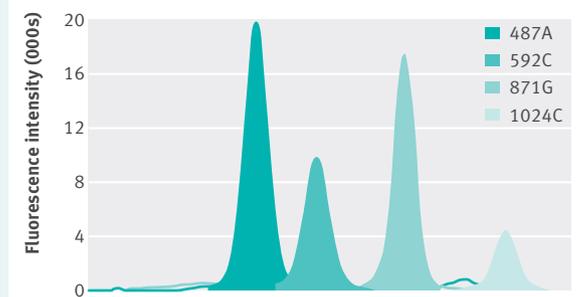
Find the full version with references at <http://dx.doi.org/10.1136/bmj.j4484>

CASE REVIEW

A young man with severe acute haemolytic anaemia

A 19 year old man of Kachin ethnicity presented with fever (39.5°C) and was diagnosed with vivax malaria by microscopy. He was prescribed chloroquine and primaquine and his fever resolved. After 24 hours he experienced two days of passing dark urine, followed by an episode of syncope, and was admitted to hospital. On admission, he weighed 59 kg and was afebrile (36.2°C), his heart rate was 120 beats/min, blood pressure 70/40 mm Hg, and respiratory rate 36 breaths/min. He was moderately jaundiced and his conjunctivae and nail beds were pale. The spleen was palpable at 1.5 cm below the left costal margin. His blood smear was negative for malaria parasites and a beam test was negative.

Tests showed reduced haemoglobin (34 g/L; reference range 110-160), haematocrit (9.2%; 35-50), and red blood cell count ($1.1 \times 10^{12}/L$; $3.5-5.5 \times 10^{12}$). The patient's urine contained bilirubin and haemoglobin but no red blood cells. Total bilirubin was 71.9 $\mu\text{mol/L}$ (reference range 3.4-17.1), unconjugated bilirubin 52.1 $\mu\text{mol/L}$ (1.7-10.2); urea nitrogen 18.45 mmol/L (1.07-7.14), and creatinine 235.4 $\mu\text{mol/L}$ (44-132). A fluorescent spot test found G6PD deficiency, enabling a diagnosis of acute haemolytic anaemia. Genotyping by a SNaPshot assay of G6PD in 11 common G6PD mutations that occur in South East Asia showed that he carried the G6PD Mahidol variant (487G >A) (right).



Electropherogram showing SNaPshot genotyping for the G6PD gene. G6PD Mahidol 487G >A hemizygote was found

- 1 What is the likely cause of the patient's acute haemolytic anaemia?
- 2 Which laboratory tests help confirm this diagnosis?
- 3 How would this patient be managed?

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1 The clinical features (severe anaemia, jaundice, splenomegaly, urine change, normal white blood cell count, and negative beam test), medical history (primaquine intake), and results of laboratory tests (G6PD and the Mahidol variant) were consistent with primaquine induced acute haemolytic anaemia.

2 Laboratory tests for haemoglobin, haematocrit, and red blood count by a complete blood count show the degree of the patient's anaemia. Rapid diagnostic tests for G6PD activity and genotyping of G6PD variants confirmed the G6PD deficiency.

3 While primaquine is stopped, rescue measures and transfusion need to be performed immediately.

Spleen of a patient with haemolytic anaemia, showing macrophages (dark blue) that have ingested the remnants of dead red blood cells

answers

Painful groin in a young adult

A 24 year old man presented with a three year history of right groin pain, which was initially managed with physiotherapy for muscle strain. Pelvic radiography showed ill defined lytic lesions in the right pubic ramus, with permeative bony destruction (figure, white arrows), periosteal reaction,

and a soft tissue component (black arrows). Biopsy confirmed histology of Ewing sarcoma. Ewing sarcoma is the second most common primary sarcoma in young adults under 30. It is more common in men, and typically affects long bones, pelvis, and ribs. Bone tumours should be among the differentials considered for

bony pain in young patients. Persistent pain in a young adult despite conventional treatment should require imaging to rule out serious underlying disease.

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Food labelling

Different supermarket chains in Ontario, Canada implemented a star system to distinguish healthy and unhealthy foods at different times (*Milbank Q* doi:10.1111/1468-0009.12277). This provided a natural experiment to explore how consumers responded. In supermarkets where food was labelled, shoppers bought less food containing sugar and trans fats and more food containing fibre and omega-3 fatty acids. But the changes were small and there was no reduction in the calorific value of what was purchased. An exit poll found that only a minority of people understood what the labels were intended to convey.



Biological treatments for rheumatoid arthritis

Biological immunomodulating drugs are increasingly used to treat people with inflammatory arthritis, which means that the possibility of long term adverse effects is growing ever more important. A national register based study from Sweden followed more than 20 000 people who had been prescribed tumour necrosis factor inhibitors or other biological disease modifying drugs and compared them with cohorts drawn from the general population and from people treated with conventional disease modifying drugs (*JAMA Intern Med* doi:10.1001/jamainternmed.2017.4332). With

one possible exception (abatacept and an increased risk of squamous cell carcinoma of the skin) there were no indications that biological treatments raised the risk of malignant neoplasms.

Respiratory rate

Respiratory rate is a component of several risk prediction scores, but an analysis of electronic hospital records from the US suggests that it's often measured in a perfunctory way (*BMJ Qual Saf* doi:10.1136/bmjqs-2017-006671). Values were clustered at 18 and 20 breaths per minute, the distribution was skewed and there was little variation even among those compromised by cardiopulmonary disease. Heart rate by contrast was normally distributed. The investigators think this shows that respiratory rate is usually guessed at, rather than counted, with values of 18 and 20 representing normal.

Neurological complications of sarcoidosis

Neurological complications of sarcoidosis are rare but serious. They affected 3% of people in a cohort of patients with incident sarcoidosis in the US. Cranial nerve involvement was the commonest manifestation, closely followed by peripheral neuropathy and meningitis. Most patients responded well to high dose glucocorticoids initially, but relapse was common. Disease modifying anti-rheumatic disease drugs were often needed as steroid sparing agents (*Neuroepidemiology* doi:10.1159/000477300).

Mesothelioma mortality

A painstaking analysis of national data from the World Health Organization database uncovered a wide range in the quality and completeness of reporting of deaths from mesothelioma (*Occup Environ Med* doi:10.1136/oemed-2017-104688). By extrapolating from the 59 countries with the best data, it estimated that the global burden of mortality is close to 40 000 deaths annually. Some countries have banned the production, import, and use of asbestos, which of course is the predominant cause of mesothelioma. However, Russia, China, Brazil, and Kazakhstan still extract nearly 2 million tons each year.

Too much medicine

An online survey of doctors in the American Medical Association finds that doctors are well aware that a lot of what they do is unnecessary and potentially harmful. Overall, they judged that more than 20% of medical care, including prescription medications, tests, and procedures, was superfluous. Fear of litigation, patient pressure, and difficulty accessing records were given as the main reasons for over-treatment and over-investigation (*PLoS One* doi:10.1371/journal.pone.0181970). Minerva can't help wondering if moving away from fee-for-service payment might be helpful.

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