

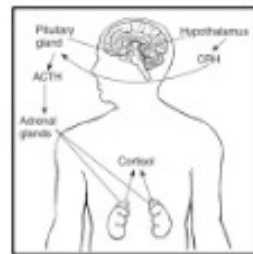
Challenges in prescribing for children and young people

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Introduction

Understand differences in pharmacokinetics

Formulations for children

Prescribing errors in children

Consent

The child's best interests and parental responsibility

Responsibilities and concluding comments....



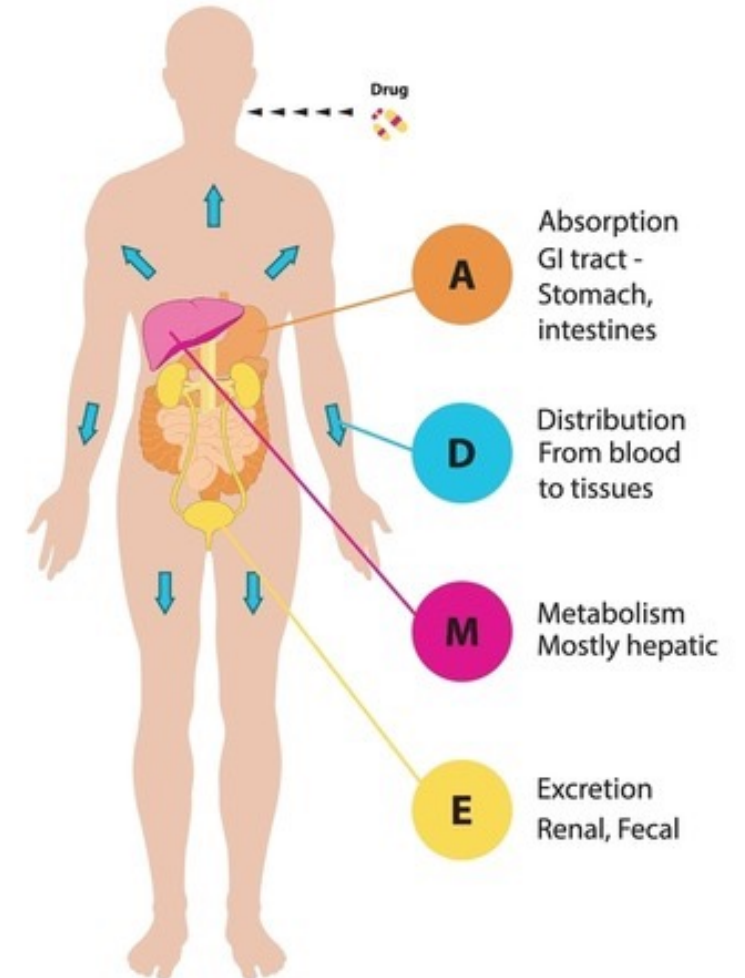
Understanding pharmacokinetics

Absorption

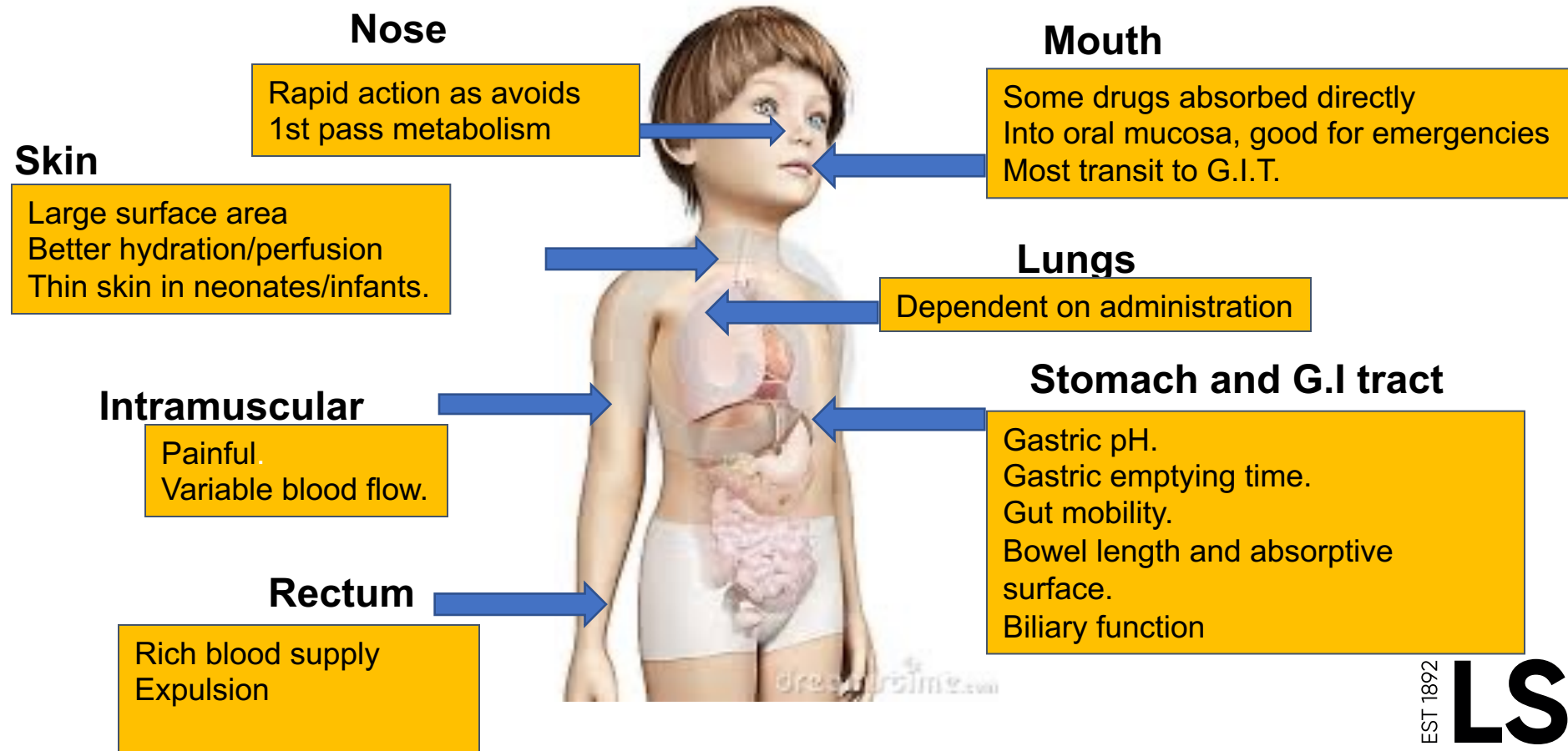
Distribution

Metabolism

Excretion



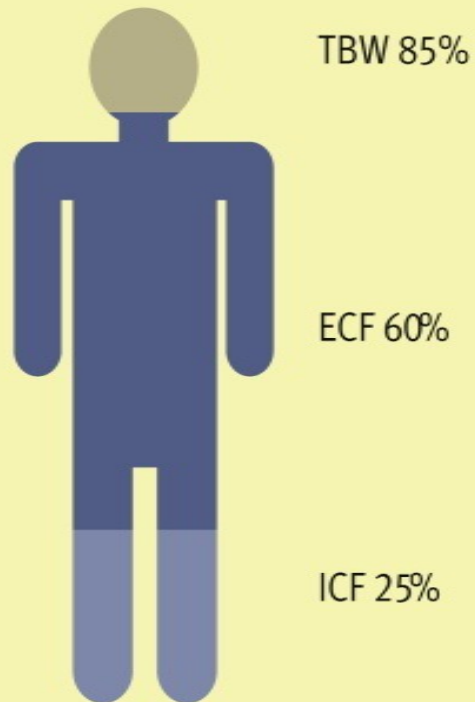
Absorption



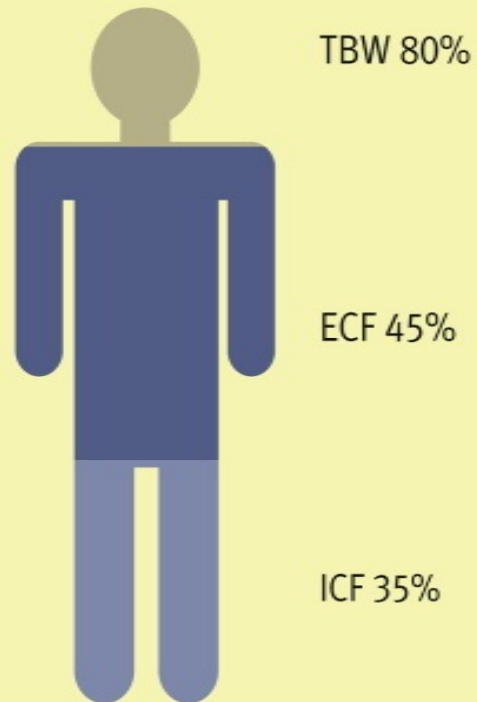
Distribution – Body Composition

Age-related body water compartments

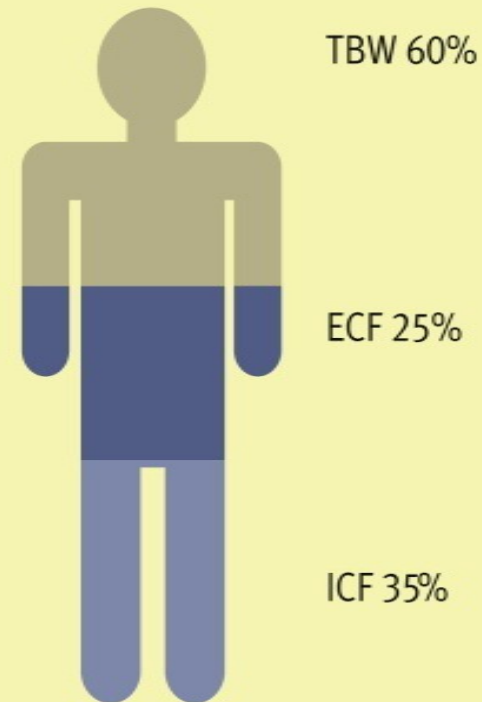
Preterm neonate



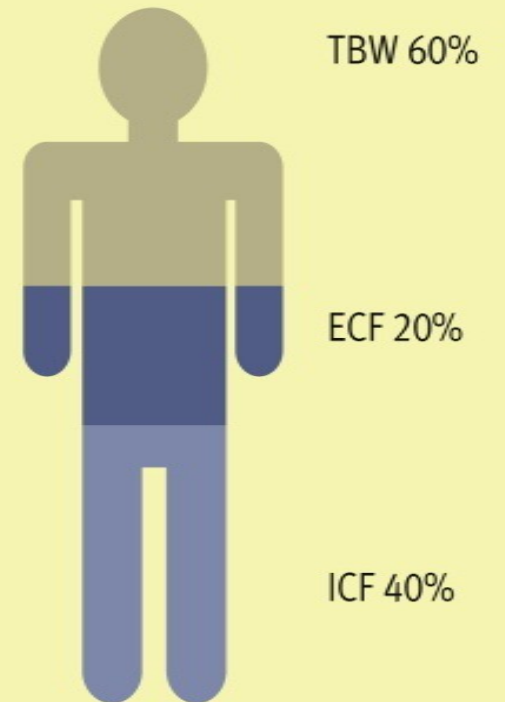
Term neonate



Infant 1 year

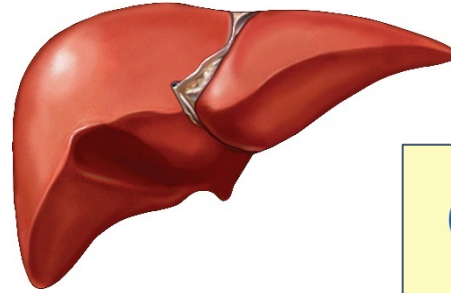


Adult man



ECF, extracellular fluid; ICF, intracellular fluid; TBW, total body water

Metabolism



At birth

Most of the enzymatic systems are either absent or are significantly reduced compared to adults

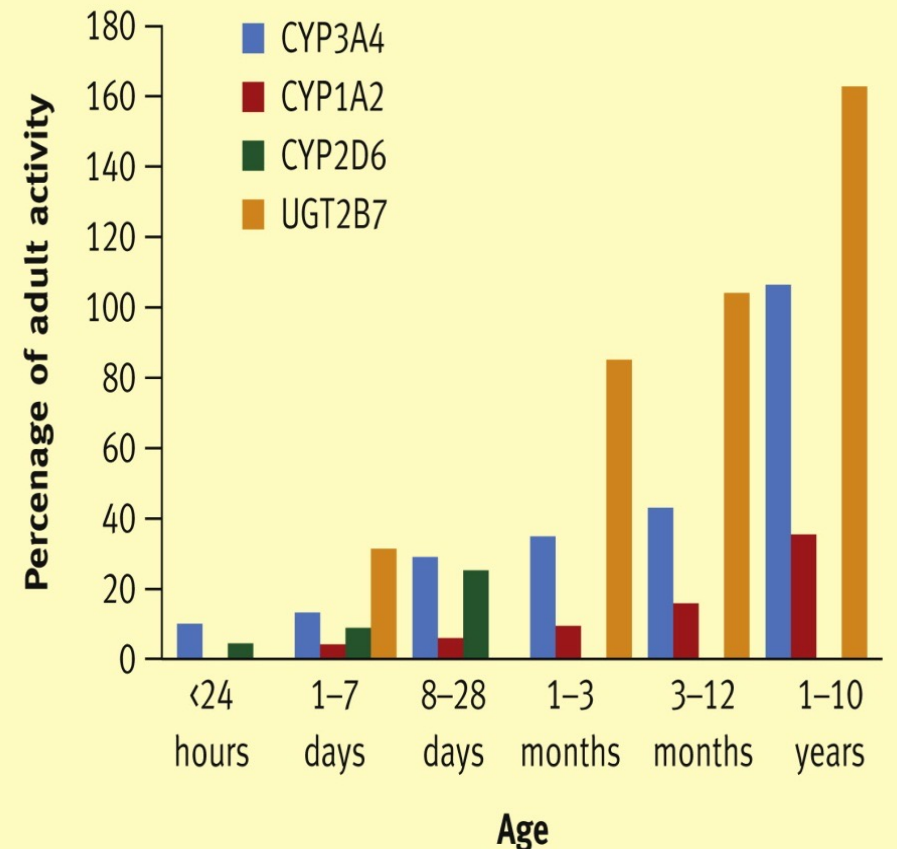
Hepatic metabolism can broadly be grouped into phase I (CYP450) or phase II reactions.

Both phase I and II reactions are age dependent.

Phase I reactions develop reasonably quickly

Phase II reactions take longer with enzyme pathways taking between 6 and 30 months to develop.

Changes in metabolic capacity



Excretion

Short renal tubules

Innervation and vascularisation is under developed

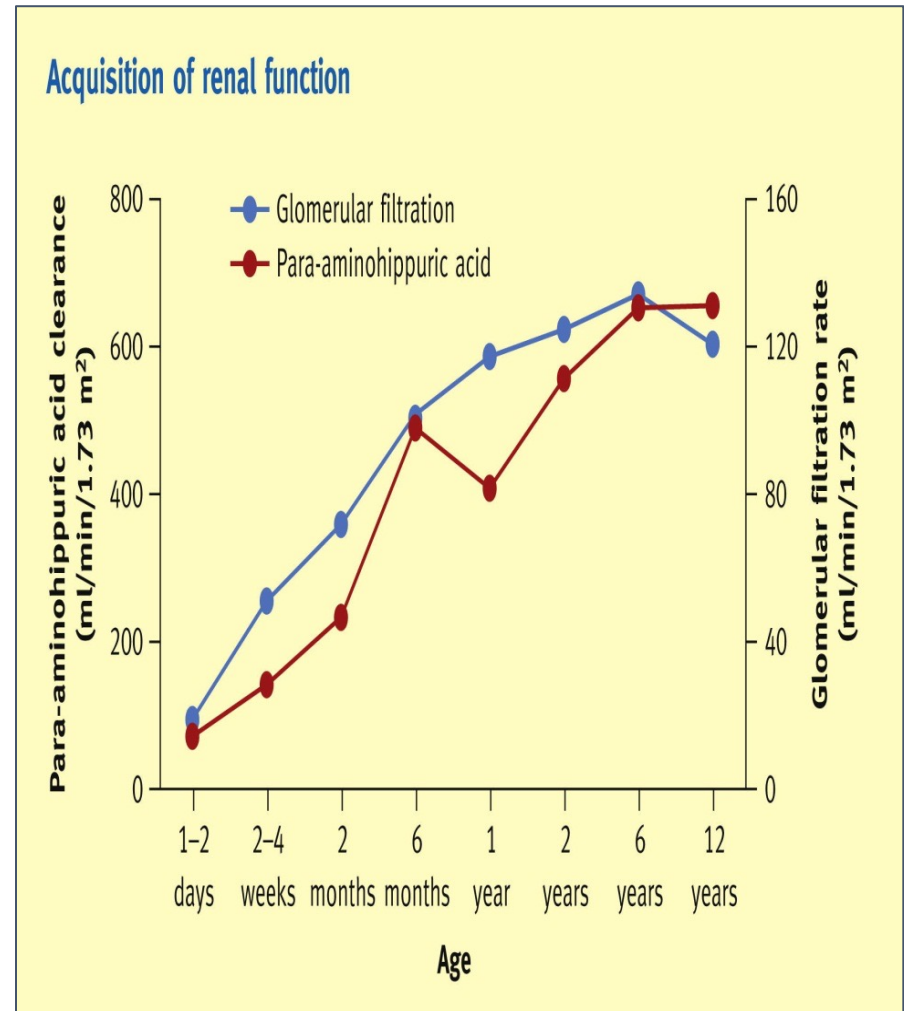
Tubular cells are small and thin

Blood flow to the glomeruli is reduced because of high vascular resistance.

Longer 1/2 life for drugs excreted by glomerular filtration eg aminoglycosides

Longer 1/2 life for drugs excreted by tubular secretion eg penicillins or sulphonamides

Increased reabsorption of acidic drugs



Formulations



Taste

Children born preferring sweet tastes

Breastmilk

Analgesia

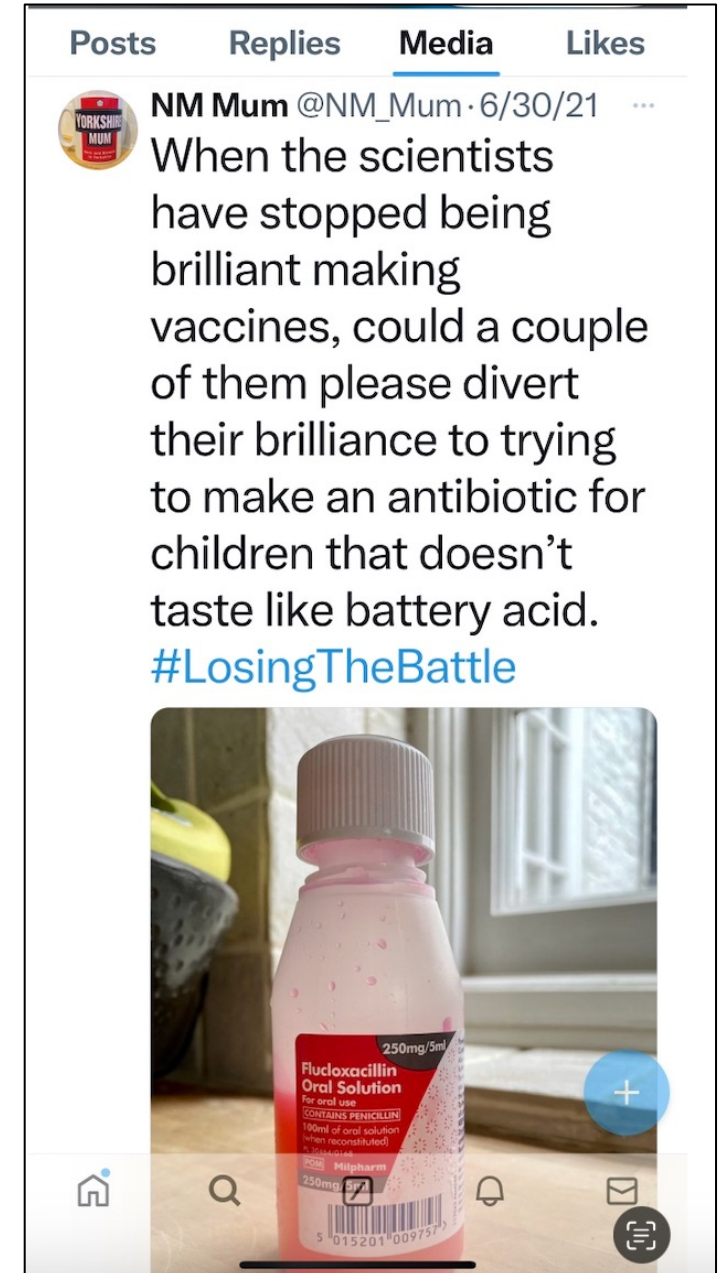
More 'bitter sensitive' than adults

Aversion to green vegetables

Need to consider palatability of oral drug formulations

Amoxicillin – v sweet

Flucloxacillin – v unpleasant



Tablets for children

Some children as young as 6 years of age can potentially swallow tablets, by providing 'pill school':

Training in swallowing sweets in varying sizes with flavoured juice / squash, such as tictacs, then smarties, and then yoghurt covered raisins

Prescribing for children – taste and palatability affect adherence to antibiotics: a review

Dave Baguley,^{1,2} Emma Lim,^{2,3} Amanda Bevan,⁴ Ann Pallet,⁵ Saul N Faust^{1,2}



Creating a Pill School – The Kidzmed Project

Creating a pill school to teach children and young people how to take tablet medication.



- <https://www.youtube.com/watch?v=XwIUU-k2FIM>
- <https://www.nenc-healthiertogether.nhs.uk/parentscarers/medicine-children/pill-swallowing-kidzmed>

Medicine preparations





Medicine preparations



Prescribing errors

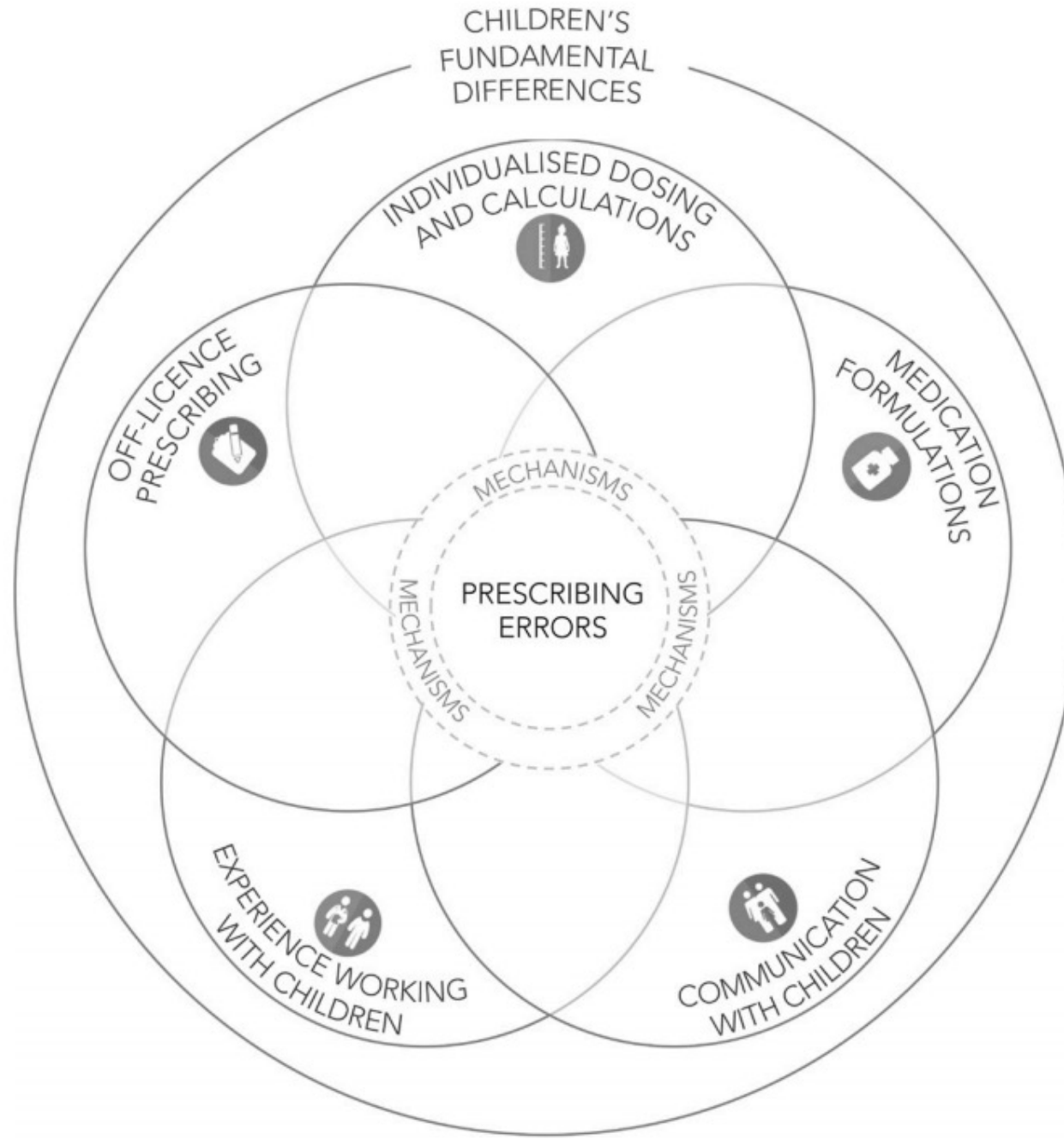
Open access

Research

BMJ Open What causes prescribing errors in children? Scoping review

Richard L Conn,^{1,2} Orla Kearney,³ Mary P Tully,⁴ Michael D Shields,^{2,5}
Tim Dornan¹

Any thoughts?



Drug calculations

Individualised dosing and calculations	Wide variation in size within the paediatric age range	1PP1 2PP1	<i>[With paracetamol] the age band [dosing] has taken a lot of thinking out of it... there's very few months go by that I don't come across an age-banded dose of paracetamol that is essentially a toxic dose... It's 80, 85, 90 milligrams per kilogram per day. It doesn't account for the nutritionally depleted, very small-for-age child. On the other side of immaturity, I've seen instances where the bigger kid has got bigger doses than the maximum dose or the adult dose.</i>
	Need for frequent changes to doses or dosing schedules	3PP1	<i>Co-amoxiclav has come up in drug errors, and that has been prescribed every eight hours for a child within the first three months of life, whereas it [should be] every 12 hours.</i>
	Inadequate mathematical skills	4PT2	<i>I like someone else to check it and say 'yes, that is right', and I like them to know where my calculations are coming from, but I find that some [team] members might need more help with calculations.</i>
	Calculation errors when distracted	5PT1	<i>I prescribed an antibiotic on a busy ward round, I made a mistake in my calculation—it was an easy calculation, 10 kilo child, four milligrams per kilogram—I wrote the dose and prescribed 100 mg. It was a mistake, and I was just busy. The nurses mustn't have checked the dose—they gave the dose and then said to me after 'gosh, that child has got quite a big dose, they gave them much more than I gave the child across the bay' and I was like 'oh, what happened?' and then I knew straight away... I mean, I can do four times 10, I did A Level Maths, so distractions happen.</i>
	Problems with weights and weighing	6PT2	<i>There are errors when you can't actually get a weight. I've had patients, because of certain problems, arthrogryposis comes to mind, (that weren't) weighed and then received ibuprofen, more than what they should for their weight, and had kidney problems because of it... weights can be difficult and time consuming for the nursing staff.</i>

Off licence drug use

Off-licence drug use	'Special' formulations	7PP1	<i>Off-licence medications are things that (aren't) available with the UK licence... a specialist manufacturer somewhere will start producing a medication, or it'll be licensed in Europe or something like that, and we'll import that. Some of those products need translated so they don't have a UK label on them.</i>
	Multiple, inconsistent resources	8PT2	<i>A lot of centres, neonatal units, will have different prescribing manuals, so whereas you're used to [using] a certain medication in such a way, you'll go to a manual, it'll say do it a different way.</i>

Best practice in prescribing off-label medication for children

Michelle Bennett

Nurse Prescribing 2018 Vol 16 No 5

Medication formulation

Medication formulations	Formulations intended for adults	9PP1	<i>They are liquid medications targeted at adult doses, so you can potentially give quite a lot more to a child than you intend to [without administering an] outrageous amount of liquid. If you're going to overdose an adult, you're going to have to give them 25 to 30mls, whereas with a small baby using that preparation you could do a lot of damage with 3 to 4 mls.</i>
	Problems with liquid formulations	10PN1	<i>That conversion from milligrams to mls will also be where errors occur.</i>



Experience working with children

Experience of working with children	Trying to remember doses rather than look them up	11PT1	<i>Adults were set doses and if it was 'came in with a chest infection from A&E', oh you're going to prescribe them whatever the dose was; you would have known [without looking it up], and you probably just would have looked up their renal function, I wouldn't have looked up everything.</i>
	Not recognising differences in prescribing for children	12PT1	<i>I've had both [situations]—being in a District General [Hospital] with ENT surgery, either asking for your help, or fixing a prescription [on their behalf], and again with [intravenous] fluids, both asking for your help and fixing their prescriptions because they just didn't know.</i>
	Prescribers not checking, despite unfamiliarity	13PN2	<i>It's about a degree of self-confidence, in the sense that if you are checking and doing your independent calculations and everything else, then you have to be able to say 'look, I don't understand this' and not go with your colleague. So often we see [team members]... not even double checking or anything, just going ahead.</i>

Communication

Communication with children	Difficulties in accurate medicines reconciliation	14PT1	<i>They make mistakes like telling you the wrong amount of mls, or they're converting it to milligrams themselves—I was told 10 times the dose of a medication the other day, because the parents said it was 250 when it was actually 25—I think they must have tried to convert it themselves.</i>
	Inadequate communication of prescribing decisions to parents	15PC1	<i>I discover they only gave it for three days, and found that they couldn't [administer] it because they didn't know how to do it properly, and it's a very bitter medicine, and then they just gave up, and then this child's had two weeks with no treatment and then they're back to me and they are no better, and I have learnt through that.</i>

the

PHARMACEUTICAL JOURNAL

A Royal Pharmaceutical Society publication

Communicating with parents and involving children in medicines optimisation

PJ pharmaceutical-journal.com/cpd-and-learning/learning-article/communicating-with-parents-and-involving-children-in-medicines-optimisation/20203683.article

The Pharmaceutical Journal 24 OCT 2017 By Ashifa Trivedi

Although children take responsibility for taking their medications at different ages, involving parents, and where possible children, in decision making is key to medicines optimisation.

Communication with children

- The Me First Communication model (Martin et al, 2019)
 - Puts the Child / Young Person at the centre of conversations and decisions about their healthcare





Consent and capacity

Mental Capacity Act (2005)

Statutory framework to empower and protect vulnerable people who are not able to make their own decisions.

It makes it clear who can take decisions, in which situations, and how they should go about this.

It enables people to plan ahead for a time when they may lose capacity

Consent – Under 16s

Gillick v Fraser??



Consent – 16 – 17 year olds

- Can consent like adults can
- No need for parental consent
- If too difficult
 - Parents can consent
- No legal limit for buying OTC medications
 - Discretion of the Pharmacist

Think...



You are working as a school nurse and are running an immunisations clinic giving HPV vaccines.

Rosie is 14 - she wants the vaccine, but her parents don't want her to.

Can Rosie consent?

What would you do?

Answer?

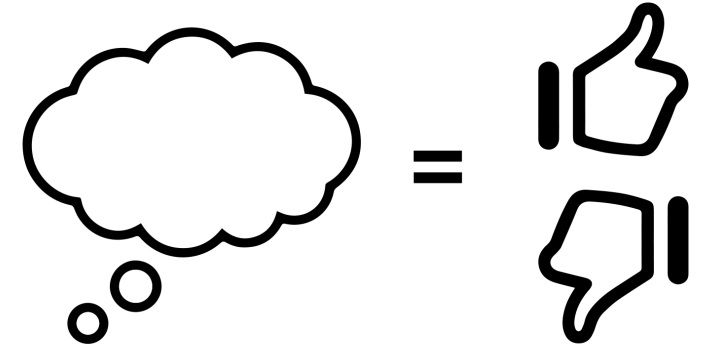
As the school nurse, you should try to involve Rosie's parents in the decision making, and could offer to talk to them, and discuss the vaccine benefits.

Even though Billie is below 16, if you have assessed her as 'Gillick competent' – ie, she fully understands what is involved – she can consent for herself, even without her parents agreement.

The vaccination can go ahead legally....

..... although it is better to gain the parents agreement...

Think..



Will is 15 years old, and refuses to have chemotherapy because he does not want to suffer the side effects of nausea and hair loss, and thinks he will get better without it.

He seems to be competent to make up his own mind about this decision, and fully understands the implications of refusing treatment.

His parents disagree, and they want to consent.

What should happen?

What do you think should be the best solution?

Answer?

By law, Will's parents can override his refusal to treatment.

However, it would be very unfair to betray Will's trust and enforce treatment.

But – if Will is NOT treated, there would be serious consequences.

A decision should be made to ask a court to decide what is in his 'best interests'.

It's likely the court will decide that Will should have treatment

- Which he might find easier to accept as it has not been forced on him by people closely involved

What about Best Interests?



Best interests...

Daily Mail
TUESDAY, JULY 25, 2017 www.dailymail.co.uk NEWSPAPER OF THE YEAR 65p



Sleep tight our beautiful little boy

THE parents of Charlie Gard bitterly condemned doctors yesterday after they made the heartbreaking decision to let their baby son die.

Connie Yates reduced a courtroom to tears while accusing Great Ormond Street of wasting so much time her little boy no longer had hope. 'We are so sorry we couldn't save you,' she said. 'We had the chance but we weren't allowed. Sweet dreams baby. Sleep tight our beautiful little boy.'

Even the judge appeared to wipe away a tear when Miss Yates said her 'warrior son' - pictured above before he became ill - would not live to see his first birthday next week. Charlie's life-support system will be withdrawn after his parents reluctantly gave up their eight-month fight.

By Sam Greenhill
Chief Reporter

Turn to Page 4

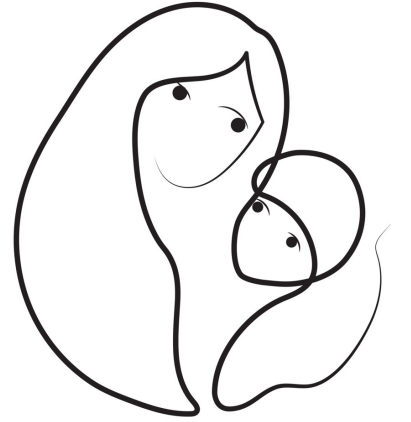
CHARLIE'S PARENTS END THEIR FIGHT PAGES 4-11



Parental responsibility

Who?

Parental responsibility



A mother automatically has [parental responsibility](#) for her child from birth.

A father usually has parental responsibility if he's either:

- Married to the child's mother
- Listed on the birth certificate (after a certain date, depending on which part of the UK the child was born in)

If the parents of a child are married when the child is born, or if they've jointly adopted a child, both have parental responsibility.

They both keep parental responsibility if they later divorce.

Parental responsibility

- Parental responsibility is described by the Children Act (1989) as all the rights, powers and duties a parent has over a child and its property.

- Those rights include the right to consent to treatment for a child right up until the child's eighteenth birthday.

- It is essential, therefore, that nurse prescribers are aware of who has parental responsibility for a child in their care and the extent to which parental responsibility allows a parent to refuse treatment for a child

- Parental responsibility is also provided to:
- Anyone legally appointed as the child's guardian
- Those who legally adopt a child.
- Those who have a child's residence order made in their favour.
- A local authority or other authorised person where a court order or emergency protection order has been made for a child.
- Where a care order has been made, the local authority designated to provide that care



Responsibility:

You must **only** ever prescribe within your level of experience and competence

You have a responsibility to communicate effectively with other practitioners involved in the care of your patient / client

You must refer the patient / client when necessary

Professional prescribing

8. PRESCRIBE PROFESSIONALLY

STATEMENTS SUPPORTING THE COMPETENCY

- 8.1. Ensures confidence and competence to prescribe are maintained.
- 8.2. Accepts personal responsibility and accountability for prescribing^a and clinical decisions, and understands the legal and ethical implications.
- 8.3. Knows and works within legal and regulatory frameworks^b affecting prescribing practice.
- 8.4. Makes prescribing decisions based on the needs of patients and not the prescriber's personal views.
- 8.5. Recognises and responds to factors^c that might influence prescribing.
- 8.6. Works within the NHS, organisational, regulatory and other codes of conduct when interacting with the pharmaceutical industry.

FURTHER INFORMATION ON THE SUPPORTING STATEMENTS FOR COMPETENCY 8

- a. Prescribing decisions include when prescribing under a shared care protocol/agreement.
- b. Frameworks for prescribing controlled drugs, unlicensed and off-label medicines, supplementary prescribing, and prescribing for self, close family and friends.
- c. Factors include interactions with pharmaceutical industry, media, patients/carers, colleagues, cognitive bias, financial gain, prescribing incentive schemes, switches and targets.

If you are not sure

DON'T

Summary

- Pharmacokinetics
- Formulations
- Consent
 - Parental responsibility
 - Child's best interests

**Nursing Children
& Young People**

Journal of
Prescribing Practice

- Prescribing errors
- Responsibilities

PROFESSIONAL

The current state of paediatric
non-medical prescribing

Kate Davies

LSBU Paediatric NMP Study Day

Friday 5 July 2024



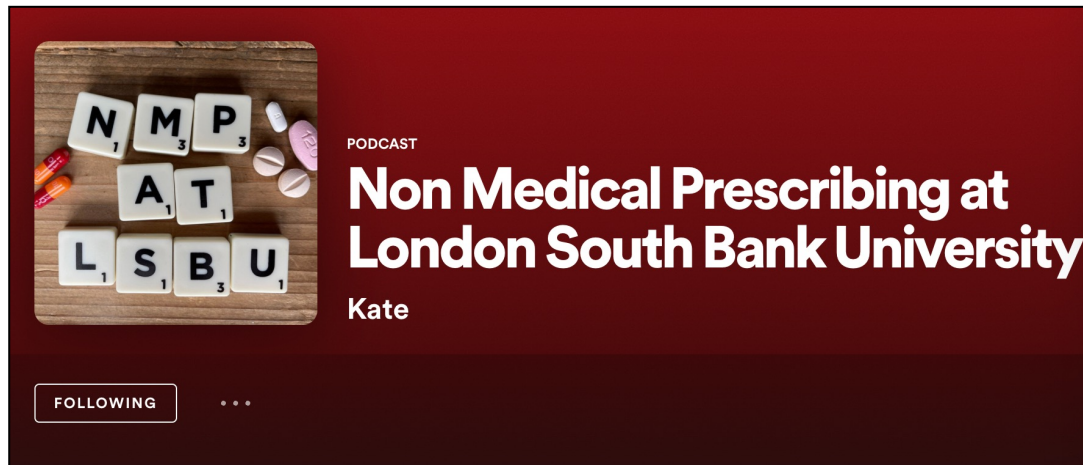
Thank you



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