Ashford and St. Peter's Hospitals
NHS Foundation Trust

Approach to Primary Nephrotic Syndrome in Paediatrics

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Guideline History		
Date	**Comments**	**Approved By**
November 2014	New guideline	Paediatric guidelines group
May 2024	- Whole document review - Approach modified to reflect ELCH's guidelines - Referrals box added	Paediatric guidelines group

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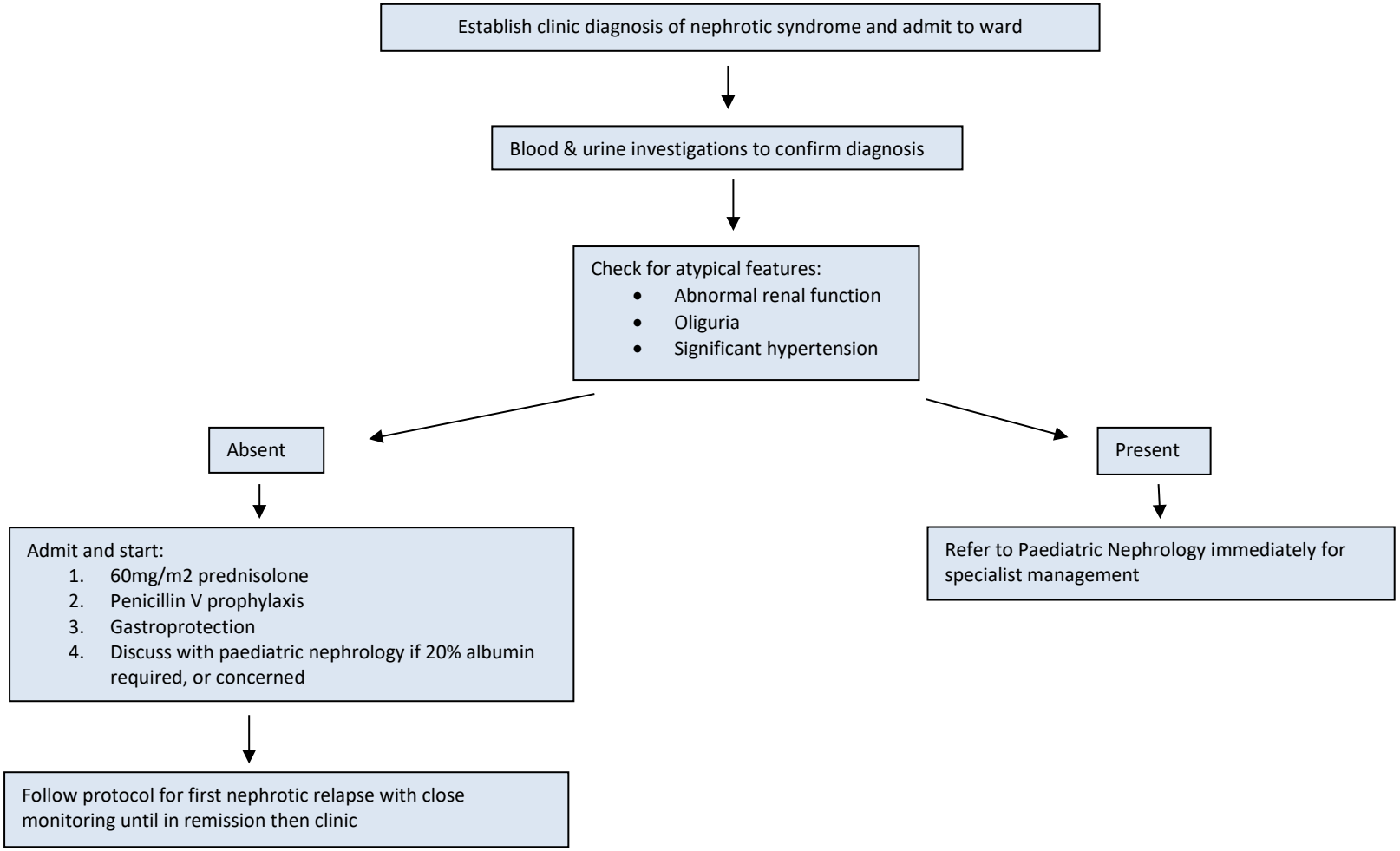
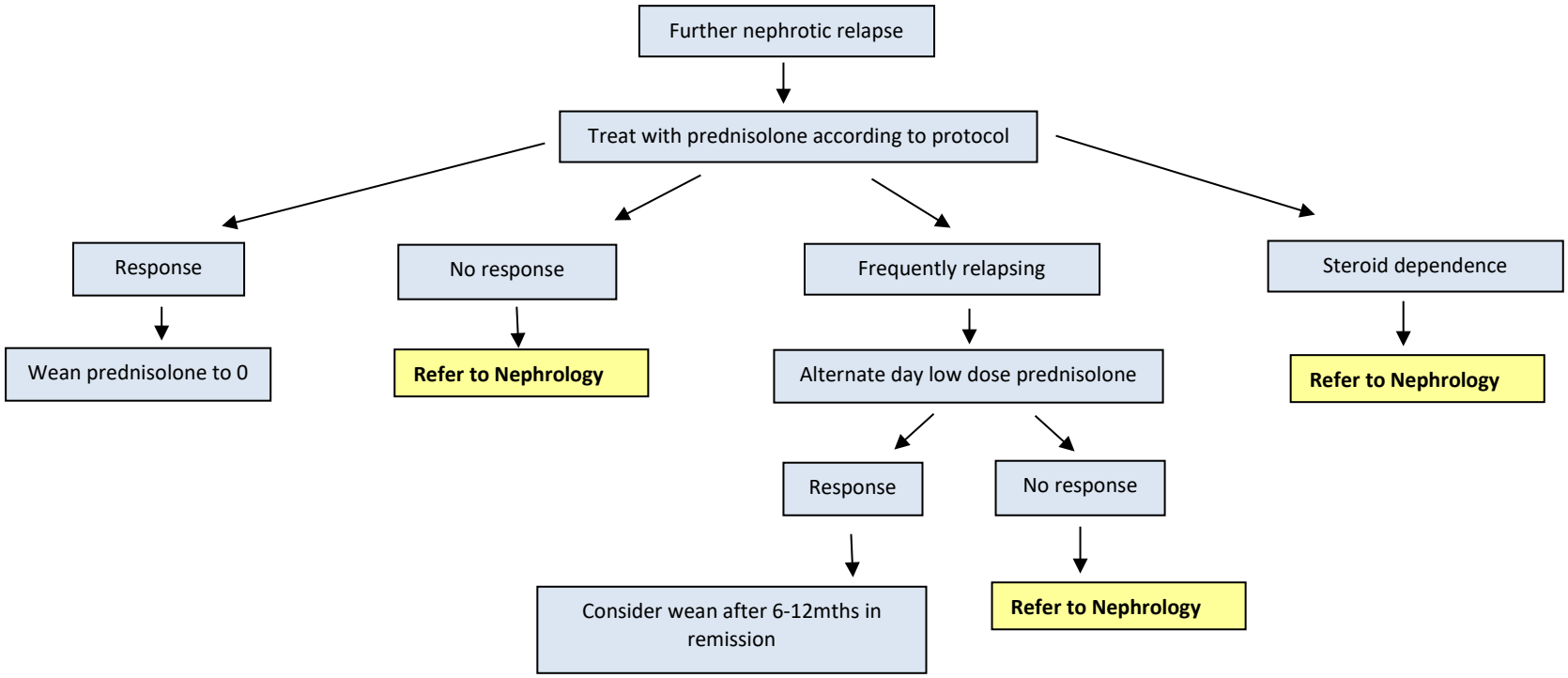
First nephrotic syndrome presentation flow chart



Subsequent nephrotic syndrome relapses flow chart



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1. Approach to Primary Nephrotic Syndrome in Paediatrics

a. Introduction

- This guideline relates to the management of Primary (Idiopathic) Nephrotic Syndrome (NS) with an onset within the paediatric age range.
- The aim is to provide a guideline to treatment as well as a background to aid optimal clinical diagnosis and management.
- We aim to standardised approach to managing this condition by following the guideline from our tertiary centre at Evelina London Children's Hospital.

b. Background

- Primary nephrotic syndrome is the commonest glomerular disorder in childhood.
- Prevalence is between 2 –15 cases per 100,000 children in the UK, dependent on the admixture of African and South Asian populations where there is higher than European.
- Currently, the best prognostic marker in primary NS is steroid response
    - Around 80% of children are steroid sensitive (SSNS).
        - Although time to final remission cannot be reliably predicted, most SSNS patients have minimal change disease which is not associated with deterioration in kidney function and prognosis is good.
    - 20% of patients have steroid resistance (SRNS)
        - Focal segmental glomerulosclerosis (FGGS) is the principle diagnosis and more common in patient of West African descent in view of enrichment of predisposition alleles in the APOL1 gene
        - Response to treatment is mixed and around 50% of patient with SRNS are at risk of eventual renal failure.

c. Definitions:

- **Nephrotic Syndrome (NS)** =
  - Nephrotic range proteinuria – significant urinary protein loss resulting in oedema and low serum albumin (protein ≥3+ urine dip or Protein creatinine ratio >200 mg/mmol)
  - Hypoalbuminaemia (< 25g/l)
  - Oedema
  - Hyperlipidaemia
- **Remission** = Negative protein on a urine dip for 3 consecutive days
- **Nephrotic Relapse** = measuring ≥3+ protein on urine dip for 3 consecutive days

- **Frequently Relapsing =**
  - ≥ 2 relapses with 6 months of the initial response, or
  - ≥ 4 relapses within any 12-month period.
- **Steroid Dependent** = failure to wean steroid medication manifested as:
  - a) relapse despite alternate day prednisolone or,
  - b) relapse within 2 weeks of stopping prednisolone
- **Steroid Sensitive NS (SSNS) =** Initial relapse within 4 weeks of 60mg/m2 of daily oral prednisolone
- **Steroid Resistant NS (SRNS) =**
  - **Primary** = No remission achieved despite a 4 week-course of 60mg/m2 oral prednisolone given daily after the initial presentation
  - **Secondary** = development of steroid resistance despite previous steroid response at any time

d. Classification

(i) Clinical

Primary

- **Steroid sensitive** – initial relapse responds to 60mg/m2 oral prednisolone within 4 weeks of treatment
- **Primary Steroid resistance** – initial relapse does not respond to 4 weeks of 60mg/m2 oral prednisolone
- **Secondary steroid resistance** – development of steroid resistance despite previous steroid response at any time

Secondary

- Systemic disease resulting in a secondary nephrotic syndrome: includes obesity (metabolic syndrome), diabetes mellitus, hypertension, post-streptococcal nephritis, Henoch-Schonlein purpura, systemic lupus erythematosus, chronic glomerulonephritis (MPGN, C3GN).

Congenital NS

- presents within first 3 months after birth – >95% have a genetic cause

Early onset NS

- presents between 3 months and 18 months of life – 60% have a genetic cause

(ii) Histology

- Supports clinical management and informs longer term prognosis.
- **Steroid sensitive nephrotic syndrome**
    - characteristic histology in uncomplicated steroid responsive nephrotic syndrome is minimal
    - change: normal light microscopy, podocyte foot process fusion on EM
- **Steroid resistant nephrotic syndrome**
    - Focal segmental glomerulosclerosis (FSGS)
    - Diffuse mesangial sclerosis (DMS)
    - Membranous nephropathy
    - Congenital nephrotic syndrome (Finnish Type)

e. Clinical Features

Oedema:

- Most children with nephrotic syndrome present with oedema. However, it doesn't occur in every patient.
- Commonly affected areas at presentation are periorbital, sacral, lower extremities and genital (i.e. scrotal or labial) areas.
- The oedematous areas are soft and pitting with no erythema.
- Oedema can progress into anasarca (i.e. generalized and massive oedema), which may present as any of the following:

- Marked peripheral oedema
- Abdominal distension resulting from ascites
- Pleural and/or pericardial effusions
- Marked scrotal or vulvar oedema
- Severe periorbital oedema resulting in swollen shut eyelids

Hyperlipidaemia:

- ↑ total cholesterol, ↑ LDL, ↑ TG.

Haematuria:

- 1 in 5 patients can have Microscopic haematuria.
- Atypical features include Macroscopic (gross) haematuria which warrants urgent discussion with a paediatric nephrologist.
- It can also be a sign of renal vein thrombosis.

Hypertension:

- Blood pressure should be manually measured using right-sized cuff and the trend should be monitored.
- Hypertension is rarely present in 'typical' cases. However, if it is present, urgent discussion with a paediatric nephrologist is necessary.

Typical vs Atypical features:

- It is vital to recognise 'atypical features' in cases with nephrotic syndrome. Once detected, discuss urgently with a tertiary centre.

Table 1: Typical and Atypical features of Nephrotic Syndrome

Typical Features	**Atypical Features**
Peak incidence: toddler and pre-school age group (range 2 - 5 years)	≤1yr, ≥10years
Normal BP	Elevated BP
Normal Creatinine	Elevated Creatinine
Normal complement and autoantibodies	Low C3; autoantibody positive
+/- Microscopic haematuria that resolves after the acute phase	Macroscopic Haematuria
No systemic disorder	Systemic features such as rash, joint pain/swelling
No family history of renal disease	Family history of renal disease

Children who present with typical features:

- >90% will be responsive to steroid treatment
- can be started on steroids without need for renal biopsy
- may require albumin if symptomatic hypovolaemia present
- will require initial admission to monitor BP, urine output and response to prednisolone
- will require monitoring and should not be discharged without a follow-up appointment

- *Caveats*
    - < 10% will have only the one initial relapse. As there are no predictive prognostic biomarkers, *all* require initial outpatient follow in view of the risk of further relapses for at least one year
    - Early relapse especially within the first 4 months of diagnosis confers increased risk of steroid dependence and difficult nephrotic syndrome. Discuss these cases with the ELCH nephrotic syndrome team as may need prompt additional intervention with a steroid sparing agent.

Children with atypical features:

- discuss with ELCH Paediatric Nephrology ***as soon as possible, and before*** any treatment
- may require a renal tract ultrasound
- are likely to require renal biopsy
- are more likely to have secondary nephrotic syndrome
- are more likely to respond poorly to treatment
- may have systemic disease that requires specific treatment

f. Investigations

- A diagnosis of nephrotic syndrome is established on clinical features and a urine dip. Box A summarises mandatory initial investigations and monitoring. Oedematous children are often difficult to bleed. As such, if there are no atypical features initial investigations may be limited to:

Box A: Initial Investigations for nephrotic syndrome with NO atypical features:

Initial Investigations

- FBC
- Renal and bone profile and albumin (to include sodium, potassium, urea, creatinine calcium, phosphate, albumin & total protein)
- Varicella status
- Urine protein:creatinine ratio or albumin:creatinine ratio
- Urine sodium if suspect hypovolaemia

Box B: Secondary Investigations for nephrotic syndrome with NO atypical features:

Secondary Investigations

- Measles and rubella IgG
- Liver function
- Complement: C3 and C4
- Common autoantibodies
- Renal ultrasound
- Specific investigations linked to individual presentation

g. Management

Table 2: Mandatory clinical monitoring and investigations during first nephrotic presentation

	At presentation	**During hospital stay**
Height	Yes	-
Weight	Yes	Twice daily
Surface Area	Yes – use ideal weight for height	-
BP	Yes	4 hourly
Oedema	Assessment of degree of oedema/ascites/pleural effusions	Daily +
Cardiovascular	*Indicators of fluid overload:* • tachycardia, • hypertension, • respiratory distress, • warm peripheries, • hepatomegaly, • raised JVP *Indicators of hypovolaemia:* • tachycardia, • hypertension, • cool peripheries, • delayed capillary refill time, • oliguria	Daily +
Respiratory	If gross oedema monitor respiratory parameters +/- O2 saturations	Continue to monitor respiratory parameters +/- O2 saturations
Fluid Balance	From outset	Input – output fluid/urine daily
Blood tests	As listed above	• Blood tests do not normally need to be repeated unless abnormal, or child is receiving diuretics. • Albumin level alone does not guide treatment, so no need to repeat during initial admission.
Urine tests	Urine dip for protein and blood Protein:creatinine ratio Sodium	Daily Weekly If hypovolaemia suspected

Initial Management of a first nephrotic presentation

Initial presentation: *when to contact ELCH Paediatric Nephrology immediately for discussion +/- transfer*

Acute

- Hypovolaemia/extreme nephrosis with fluid overload
- Acute Renal Failure - oligoanuria +/- raised creatinine
- Raised Blood Pressure
- Suspected sepsis including peritonitis
- Suspected Thrombosis

Sub-Acute

1. Atypical features:
   - Persistent hypertension
   - Macroscopic hematuria
   - Abnormal renal function
   - Low C3/C4
2. Need for renal biopsy
   - Primary (or secondary) steroid resistance: children who are not in remission after 28 days of treatment with prednisolone 60mg/m2
   - Children presenting with nephrotic syndrome < 1 year and ≥ 10 years of age have an increased chance of an atypical nephrotic syndrome

Initial presentation: *management if uncomplicated first nephrotic relapse.*

- Fortunately most cases will not present with complications.
- However, treatment of an uncomplicated first relapse differs from that for subsequent relapses as it is more intensive and lasts longer.
- The primary objective is to achieve long term nephrotic remission and minimise complications such as hypovolaemia, infection and thrombosis.

1. Steroid protocol for first nephrotic presentation

- Prednisolone: doses are calculated per m2
- https://bnfc.nice.org.uk/guidance/body-surface-area-in-children-image.html
    - 60mg/m2 po daily, to a maximum daily dose of 60mg, for 28 days irrespective of whether the child goes into remission before 28 days
    - then 40mg/m2 po on alternate days for 28 days (maximum dose 40mg)
    - then 30mg/m2 po on alternate days for 14 days (maximum dose 30mg)
    - then 20mg/m2 po on alternate days for 14 days (maximum dose 20mg)
    - then 10mg/m2 po on alternate days for 14 days (maximum dose 10mg)
    - then 5mg/m2 po on alternate days for 14 days (maximum dose 5mg)
    - then stop

2. Penicillin V prophylaxis

- given because of increased risk of infection
- discontinue once in remission for 3 days

3. Gastroprotection

- Ranitidine; or for ease of use (once daily dose) proton pump inhibitor of choice
- given during prednisolone treatment
- if asymptomatic, discontinue once prednisolone dose has reduced to < 5 mg alternate days

4. Fluid Restriction

- input-output monitoring of fluids and twice daily weights essential
- not always necessary if uncomplicated relapse
- consider in worsening oedema (usually manifests as an acute weight gain) or salt and water overload with a high/normal BP or BP above expected range - *discuss with Paediatric Nephrology*
- Usually < 5 years: a fluid restriction to 750 mls is sufficient
- Usually > 5 years a 1L fluid restriction is sufficient
- Do not fluid restrict nephrotic patients with clinical evidence of hypovolaemia +/- oligoanuria as this may precipitate pre-renal failure
- Increased urine output occurs when patients entering remission start off-load oedema - lift fluid restriction and monitor

5. General Advice

- parental and child education
- nephrotic diary
- salt restriction
- diet – normal

6. Vaccinations

- No live vaccines whilst immunosuppression and for at least 3 to 6 months subsequently
- **Pneumococcal**
  - recommended for all children with NS
  - routine pneumococcal vaccine may be supplemented with Pneumovax 23 for over 2 year olds
- **Varicella (this is a LIVE vaccine)**
  - consider in siblings of varicella negative immunosuppressed children
  - aim to administer vaccine when steroids and/or other immunosuppressive drugs have been stopped for at least 3 months
- **Flu vaccination**
  - injectable (inactive), not nasal spray (this is live) if on immunosuppressive therapy
  - Vaccinate patient minimum one week before siblings/class mates receive nasal
- **Essential inactivated vaccines** must be given but inadequate immunogenic response to vaccination may be compromised if in nephrotic relapse/taking high dose oral prednisolone
- Seek appropriate advice for other immunisations and foreign travel

<u>Complications</u>

1. Hypovolaemia

- a relatively common finding
- clinical assessment difficult in compensated longstanding nephrotic disease
- increased risk of thrombotic complications if left untreated
- **Symptoms**
  - Abdominal pain
  - Cool peripheries
  - Reduced urine output
- **Signs**
  - Capillary refill time > 2 seconds
  - Toe-core temperature gap >2°C
  - Poor urine output
  - Hypotension (<5th centile), or paradoxically hypertension (>95th centile) can both be features of hypovolaemia
  - Persistent tachycardia
  - Low urinary sodium (<20mmol/L)

2. Shock

- relatively uncommon in nephrotic syndrome
- typically marked hypotension, tachycardia, very poor perfusion and lactic acidosis
- consider usual management such as iv bolus of 10 – 20 ml/kg 4.5% albumin solution, after discussion with nephrologist
- avoid 0.9% saline if possible through salt load

3. Acute renal failure

- Creatinine should be normal/low for age
- Raised creatinine indicates either acute kidney injury or an atypical presentation
- Can be a result of hypovolaemia or as a part of atypical picture
- Can lead to fluid overload

4. Infections

- Increased risk of infection: urinary loss of immunoglobulin and immunosuppressive treatment
- Risk high for encapsulated organisms, e.g. S. pneumoniae & H. influenza
- Oedema increases risk of cellulitis
- Low threshold for broad-spectrum antibiotics
- Any infection potentiates the nephrotic relapse

5. Spontaneous bacterial peritonitis (SBP)

- Bacterial infection complicating ascites
- Any nephrotic with abdominal pain and tenderness +/- fever should be commenced on IV antibiotics (peritonitis protocol) and transferred to ELCH Paediatric Nephrology

6. Hypertension

- The majority of children with uncomplicated NS have normal blood pressure.
- If hypertension present, immediately discuss with Paediatric Nephrology prior to commencing treatment as this is an atypical feature
- PRES (posterior reversible encephalopathy syndrome) is a risk of steroid treatment and hypertension in nephrotic syndrome

7. Clot Formation

- Nephrotic Syndrome is a pro-coagulant state through loss of anti-coagulant proteins
- Children in nephrotic relapse at risk of spontaneous venous and arterial thromboses
- Consider intravascular thrombosis as a cause of symptoms such as:
    - altered behaviour or headaches/vomiting (*intracranial thrombosis*)
    - cough, chest pain and breathlessness (*pulmonary thrombo-embolism*)
    - peripheral vascular changes (*DVT or arterial ischaemia)*
    - macroscopic haematuria, palpable kidney, loin tenderness, raised creatinine, hypertension (*renal vein thrombosis*)

8. Chickenpox exposure in non-immune patients

- Immunosuppressed patients testing negative for varicella IgG require prophylaxis
- Prophylaxis recommended if prednisolone dose is equal to or exceeds
    - 2mg/kg/day for a one week
    - 1mg/kg/day for one month
    - lower doses of prednisolone if additional immunosuppression
- Current guidance is to give prophylactic acyclovir (rather than VZIG) as follows:
    - Children < 2 years age: 10mg/kg, four times daily, days 7 to 14 after exposure
    - Children 2-17 years of age: 10mg/kg (maximum of 800mg), four times daily, days 7 to 14 after exposure
- Patients will require acyclovir if develop chicken pox on immunosuppression
    - 1 month - 12 years: 20mg/kg (max 800mg) 4 times a day for 5 days.
    - ≥12 years: 800mg 5 times a day for 7 days.
    - Reduce dose in renal impairment

<u>Use of 20% (salt poor) albumin in childhood nephrotic syndrome</u>

- Use of 20% albumin is based on *clinical features* and *not* the level of plasma albumin
- Consider urine output – is this adequate?
- When 20% albumin considered, contact ELCH Paediatric Nephrology team to discuss *before* administering
- Give in *daytime hours only* and with frusemide cover as maximal expansion of the intravascular compartment may occur 2-3 hours following albumin infusion finished
- Excessive and rapid fluid shifts into the intravascular space may lead to heart failure and pulmonary oedema. Strict observations mandatory even after the end of infusion
- In very severe cases, a continuous infusion at a reduced rate with adjunct iv frusemide infusion may be required

- **Clinical Indications:**
  1. *Hypovolaemia:*
  2. *Severe oedema (without clinical features of hypovolaemia):*
     - causing immobility
     - scrotal swelling and abdominal ascites causing discomfort
     - skin breakdown

- Close monitoring during 20% albumin infusion is mandatory
  - Monitor oxygen saturation, pulse, blood pressure, respiratory rate every 30 minutes regularly during and for 3 hours post infusion.
  - Accurate fluid balance measurement essential
  - *Beware of intravascular fluid overload due to fluid shift*:
    - increasing heart rate, BP, and respiratory rate: trend of observations crucial
    - visible JVP
    - development of oxygen requirement
  - If overload develops:
    - Stop 20% albumin infusion
    - give frusemide
    - may need transfer to PICU

- 20% Albumin Infusion – in consultation with ELCH Paediatric Nephrology
  - Dose of 20% albumin: infuse 2.5 to 5mls/kg (0.5 to 1g/kg) over 6 hours
  - Avoid frusemide at start of infusion as may worsen hypovolaemia

- Frusemide IV is given either mid or at the end of infusion (depending on the severity of hypovolaemia), to drive diuresis:
  - initial dose 0.5mg/kg – 1 mg/kg
  - patients usually have normal renal function and are sensitive to frusemide
  - patients who are very significantly proteinuric are relatively insensitive and may be at risk of ototoxicity if on a calcineurin inhibitor

<u>Discharge checklist for parents</u>

- Children normally require an inpatient stay following a first presentation with nephrotic syndrome. This is to control symptoms and to educate children and parents about nephrotic syndrome. The discharge date is determined by clinical response and familiarity with the treatment protocol.

- Consider contacting the specialist service for children with nephrotic syndrome at ELCH for further support and information leaflets on nephrotic syndrome via the nephrotic syndrome clinical nurse specialist on *07342 060 351 or Beach ward if during evenings or weekends*

- Before discharge, ensure carer/child:
  1. Is able to dip urine daily using Albustix and record the urine test for protein
  2. Has a diary to record daily urine tests (and does so every day)
  3. Is able to recognise a relapse, and knows who to contact during normal hours, and out of hours
  4. Is provided with advice on steroids plus a steroid card.
  5. Is provided with advice regarding course of action if in contact with chicken pox or measles if child is non-immune
  6. Understands advice on avoiding live vaccines
  7. Is provided with adequate information about travelling - to seek advice before flying if in relapse and to take enough medication in case of relapse whilst away.
  8. *Patient must have follow up appointment scheduled before discharge.*

- Further useful information for parents can be found on the Info kid website (www.infokid.org.uk)
- Information for medications found on www.medicinesforchildren.org.uk

<u>Monitoring during follow-up</u>
Daily - until in remission

1. Daily urine dip for protein – in hospital, and home
2. BP – if in hospital
3. Fluid Balance – if in hospital
4. Weight – if in hospital

Weekly

1. Monitor closely until in remission and oedema resolved on a weekly/x2 per week basis as ward attender/day case review
2. If glycosuria present, perform blood tests for plasma glucose and HbA1c with referral to endocrine team if blood levels abnormal

Subsequent Clinic Review – 2 weekly to 1 monthly depending on clinical progress

1. Urine dip for protein
2. Height
3. Weight and BMI
4. Dietetic review - where appropriate referral to obesity team
5. Psychology review if indicated
6. Community paediatric referral if indicated
7. School/nursery liaison if indicated
8. Bone age and pubertal stage where appropriate if concerns about growth
9. Ophthalmology review if indicated - if >12m continuous steroid therapy with significant cumulative steroid dose

Management of a subsequent nephrotic relapses

- Relapse may occur on or off steroid medication and is generally triggered by an intercurrent infection
- If child relapses, parents should telephone their GP, local hospital or specialist nephrology unit managing their child's condition for advice
- If uncomplicated, treatment with prednisolone and other supporting medications can usually be commenced at home.
- Parents should contact their local hospital immediately if the child
  - becomes unwell e.g. with abdominal pain, headache or fever
  - has worsening oedema
  - has reduced urine output
  - develops macroscopic haematuria
  - develops cool peripheries
  - develops shortness of breath

- Prednisolone:
  - 60mg/m2 po daily, *to a maximum daily dose of 60mg,* until remission
  - then 40mg/m2 po on alternate days for 1 week (maximum dose 40mg)
  - then 30mg/m2 po on alternate days for 1 week (maximum dose 30mg)
  - then 20mg/m2 po on alternate days for 1 week (maximum dose 20mg)
  - then 10mg/m2 po on alternate days for 1 week (maximum dose 10mg)
  - then 5mg/m2 po on alternate days for 1 week (maximum dose 5 mg)
  - then consider stopping steroids if no evidence of steroid dependence

  NB. Duration of treatment is different from treatment of an initial presentation.

- Supporting medication
  - Follow initial presentation guidelines with regard to penicillin, gastroprotection, low salt diet and symptom management.

- Management of frequent nephrotic relapses or steroid dependence is tailored to the individual and should be discussed with a Consultant Paediatric Nephrologist/Specialist Nephrotic Service at Evelina (please see Sections H and I: Management of Frequent relapses and Steroid dependence)

When to refer to Paediatric Nephrology (subsequent relapses)

1. If proteinuria does not resolve or recurs with dose reduction contact ELCH Paediatric Nephrology as may indicate early steroid dependence and intervention with a steroid sparing agent.

2. If no response within 28 days to high dose oral prednisolone this is primary steroid resistance so refer to ELCH Paediatric Nephology

Steroid Maintenance in frequently relapsing NS

Choice of Steroid regimen

- initially try maintenance low dose alternate-day prednisolone
- aim is to use the lowest dose of maintenance steroids that keeps the patient relapse free for at least 6 months
- selected by knowing at which dose the child relapses: use dose just above that
- dose required varies and is typically 5mg every other day, but should be no more than 0.5mg/kg alternate days to avoid side effects
- attempt to wean after 1 relapse-free year
- if > 0.5mg/kg alternate days persistently required to remain in remission and emerging steroid dependence need to consider a second line agent - **discuss with ELCH Paediatric Nephrology**

Management of Steroid Dependent NS

- if criteria for steroid dependence reached, early intervention with a steroid sparing agent is required to provide improved nephrotic control and avoid steroid toxicity
- renal biopsy is not generally required prior to starting a second line agent, unless patient develops secondary steroid resistance or other atypical features
- choice of second line agent should be determined in conjunction with ***advice from Paediatric Nephrology team/specialist nephrotic clinic at ELCH***
- trial of second line agent is for up to 3 months – if ineffective, escalate to next tier with further advice from specialist nephrotic syndrome service

Second line agents and treatment options

Tier 1: Mild to moderate steroid dependence

1. Mycophenolate mofetil (MMF) +/- low dose oral prednisolone
2. Levamisole – but only useful in patients of south Asian descent +/- low dose oral prednisolone

Tier 2: Significant steroid dependence or MMF/levamisole ineffective

1. Tacrolimus +/- low dose oral prednisolone
2. Tacrolimus combined with low dose mycophenolate mofetil +/- low dose oral prednisolone
3. Rituximab +/- tacrolimus/mycophenolate mofetil/low dose oral prednisolone

Tier 3: Secondary Steroid resistance – MMF/tacrolimus/prednisolone no longer effective

1. Rituximab +/- tacrolimus/mycophenolate mofetil/low dose oral prednisolone or other anti-CD20 biosimilar
2. Liposorber LDL apheresis + prednisolone

Additional issues with frequently relapsing or steroid dependant disease that may require treatment

- Increased risk of infection
- Vitamin D deficiency (loss in urine)
- Hyperlipidaemia
- Hypothyroidism (loss in urine)
- Eye examination for cataracts in patients on prolonged maintenance steroid therapy >12m with significant cumulative steroid dose

The long- term treatment objective is to prevent complications such as Cushing syndrome and other steroid-related side effects such as obesity, secondary diabetes mellitus, growth retardation, bone disease and cataracts. Importantly, steroids must be used with caution in view of significant psychological, social and behavioural disturbances which may impact on a child's schooling and quality of life.

Indications for discussion/referral with Paediatric Nephrology at ELCH in second or subsequent nephrotic relapse

<u>Acute Presentation</u>

- Atypical re-presentation even if previously not
- Poor urine output
- Raised creatinine and other indicators of renal dysfunction
- Considering 20% Albumin infusion
- Unusual clinical course e.g. hypertension or macroscopic haematuria develop subsequently
- Low C3 and/or C4 or other abnormality suggesting systemic disease

Longer Term Management Difficulties

- Steroid resistance: failure to achieve remission after 28 days of prednisolone will require renal biopsy and specialist management
- Substantive/unacceptable steroid side effects regardless of dose: will require steroid sparing agent
- Frequently relapsing or steroid dependent NS: will require steroid sparing agent
- Poor response to escalation to next tier drug – set a time limit (up to 3 months): if ineffective or pattern changes escalate treatment to next tier to avoid steroid toxicity
- Secondary steroid resistance – often resolves with addition of rituximab if SSNS (>95% chance)
- Evolution of atypical features at any point – further investigations +/- renal biopsy

h. Referrals

ELCH Nephrology Referrals

Monday-Friday, 9am-5pm:

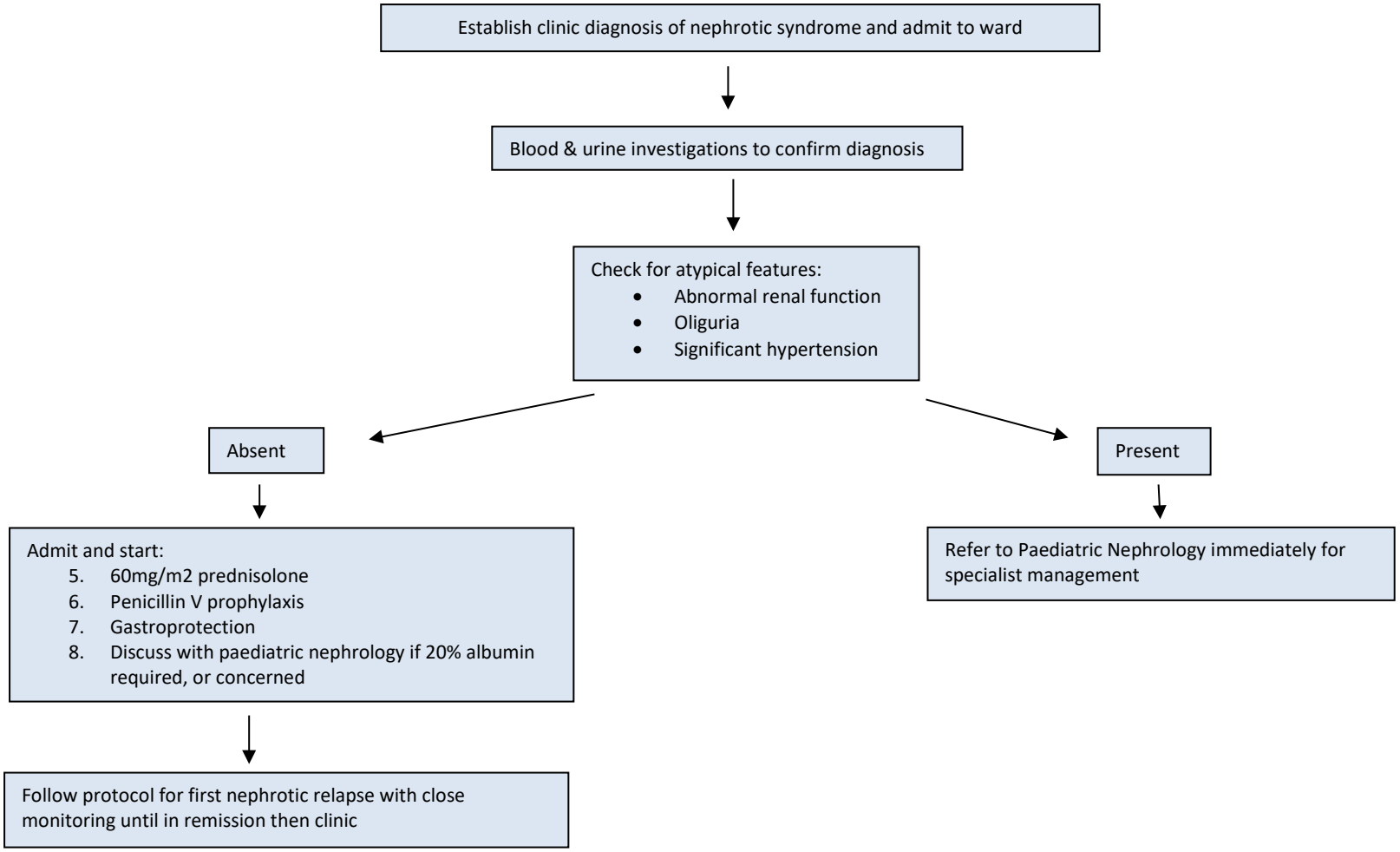
- Renal SpR on 07990800587 or on 02071887188 (bleep 1141)

For out of hours referrals:

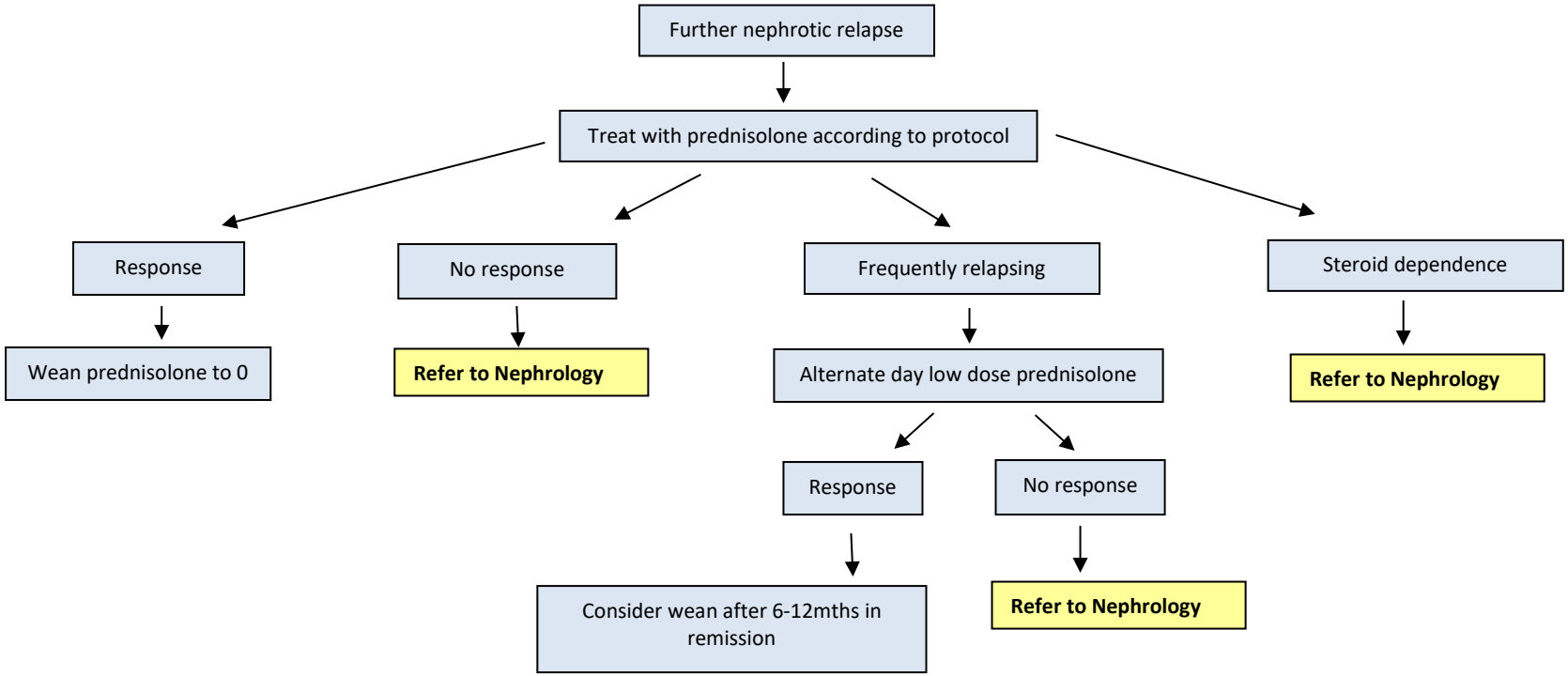
- Paediatric Specialities SpR on 07514719077 or on 02071887188 (bleep 1139)
- A paediatric nephrologist is on call and can be contacted via the hospital switchboard on 02071887188.

i. Appendices

Appendix 1. Management of first presentation of Nephrotic Syndrome



Appendix 2. Management of subsequent nephrotic syndrome relapses and when to refer



2. Supporting References

- Evelina London Children's Hospital Guidelines

3. Supporting relevant trust guideline

- Approach to Paediatric Proteinuria
- Approach to Paediatric Haematuria

4. Guideline Governance

a. Scope

This guideline is relevant to all staff caring for all children from 0-18 years old across the emergency department, inpatient ward and outpatient department.

b. Purpose

i. This guidelines aims to facilitate a common approach to the management of children. At times deviation from the guideline may be necessary, this should be documented and is the responsibility of the attending consultant.

ii. This guideline is subject to regular review to ensure ongoing evidence based practice.

c. Duties and Responsibilities

All healthcare professionals responsible for the care of all children 0-18years should be aware of practice according to this guideline.

d. Approval and Ratification

This guideline will be approved and ratified by the Paediatric Guidelines Group.

e. Dissemination and Implementation

i. This guideline will be uploaded to the trust intranet 'Paediatric Guidelines' page and thus available for common use.
ii. This guideline will be shared as part of ongoing education within the Paediatric Department for both medical and nursing staff.
iii. All members of staff are invited to attend and give comments on the guideline as part of the ratification process.

f. Review and Revision Arrangements

a. This policy will be reviewed on a 3 yearly basis by the appropriate persons.
b. If new information comes to light prior to the review date, an earlier review will be prompted.
c. Amendments to the document shall be clearly marked on the document control sheet and the updated version uploaded to the intranet. Minor amendments will be ratified through the Paediatric Guidelines Group. A minor amendment would consist of no major change in process, and includes but is not limited to, amendments to documents within the appendices.

g. Equality Impact Assessment

Background • Who was involved in the Equality Impact Assessment
Author and the supervising consultants.
Methodology • A brief account of how the likely effects of the policy was assessed (to include race and ethnic origin, disability, gender, culture, religion or belief, sexual orientation, age) • The data sources and any other information used • The consultation that was carried out (who, why and how?)
All groups of staff and patients were taken into consideration and there is no bias towards or against any particular group.
Key Findings • Describe the results of the assessment • Identify if there is adverse or a potentially adverse impacts for any equalities groups
There is no evidence of discrimination.
Conclusion • Provide a summary of the overall conclusions
There is no evidence of discrimination.
Recommendations • State recommended changes to the proposed policy as a result of the impact assessment • Where it has not been possible to amend the policy, provide the detail of any actions that have been identified • Describe the plans for reviewing the assessment
This guideline is appropriate for use.

h. Document Checklist

To be completed (electronically) and attached to any document which guides practice when submitted to the appropriate committee for approval or ratification.

Title of the document:

Policy (document) Author:

Executive Director: N/A

		Yes/No/ Unsure/NA	Comments
1.	**Title**		
	Is the title clear and unambiguous?	**Y**	
	Is it clear whether the document is a guideline, policy, protocol or standard?	**Y**	
2.	**Scope/Purpose**		
	Is the target population clear and unambiguous?	**Y**	
	Is the purpose of the document clear?	**Y**	
	Are the intended outcomes described?	**Y**	
	Are the statements clear and unambiguous?	**Y**	
3.	**Development Process**		
	Is there evidence of engagement with stakeholders and users?	**Y**	
	Who was engaged in a review of the document (list committees/ individuals)?	**Y**	**Guidelines committee- consultants, governance team and nursing team**
	Has the policy template been followed (i.e. is the format correct)?	**Y**	
4.	**Evidence Base**		
	Is the type of evidence to support the document identified explicitly?	**Y**	

		Yes/No/ Unsure/NA	Comments
	Are local/organisational supporting documents referenced?	**Y**	
5.	**Approval**		
	Does the document identify which committee/group will approve/ratify it?	**Y**	
	If appropriate, have the joint human resources/staff side committee (or equivalent) approved the document?	**Y**	
6.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	**Y**	
	Does the plan include the necessary training/support to ensure compliance?	**Y**	
7.	**Process for Monitoring Compliance**		
	Are there measurable standards or KPIs to support monitoring compliance of the document?	**Y**	
8.	**Review Date**		
	Is the review date identified and is this acceptable?	**Y**	
9.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for coordinating the dissemination, implementation and review of the documentation?	**Y**	
10.	**Equality Impact Assessment (EIA)**		
	Has a suitable EIA been completed?	Y	

Committee Approval (Paediatric Guidelines Group)			
If the committee is happy to approve this document, please complete the section below, date it and return it to the Policy (document) Owner			
Name of Chair	**Alexandra Jones**	**Date**	**27/5/2024**
Ratification by Management Executive (if appropriate)			
If the Management Executive is happy to ratify this document, please complete the date of ratification below and advise the Policy (document) Owner			
Date: n/a			