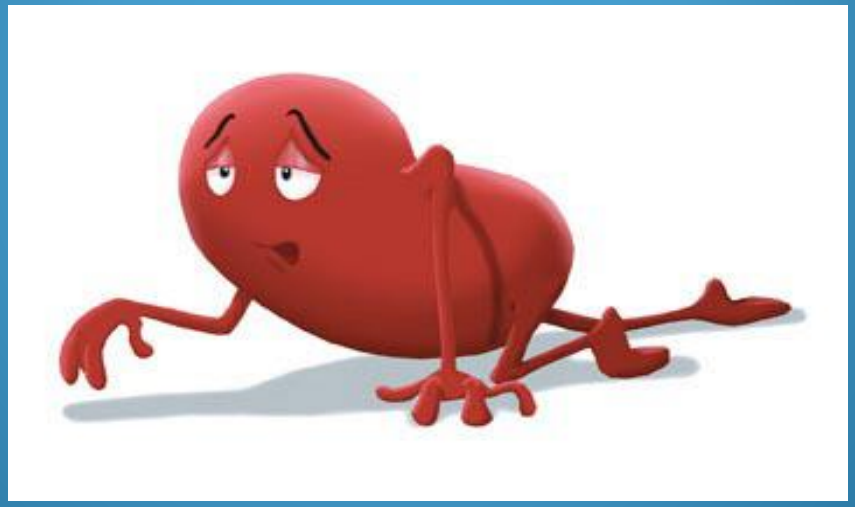
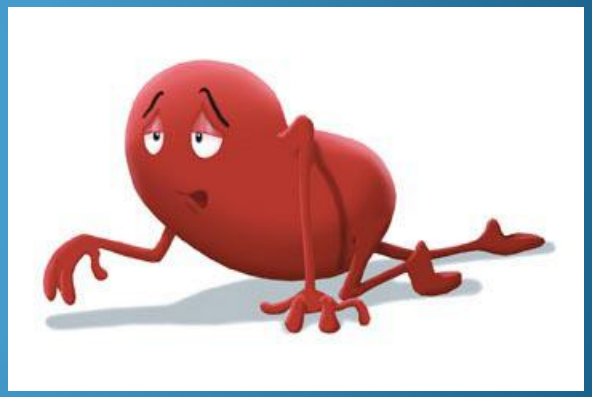
Managing Chronic Kidney Disease



August 2019
Kay McLaughlin
Renal Clinical Nurse Specialist
Capital and Coast District Health Board

Managing Chronic Kidney Disease

- What is Chronic kidney disease (CKD)
- Causes of CKD
- Treatment for CKD
- CKD in Primary Healthcare



Functions of the kidneys

- Elimination of metabolic wastes
- Fluid & electrolyte balance
- Acid/base balance
- Blood pressure regulation
- Regulation of red blood cell production
- Regulation of bone metabolism (activate vitamin D & regulate calcium/phosphate)

What is chronic kidney disease?

- A general term for chronic disorders that affect kidney structure and function
- A gradual decline of kidney function
- Classified into five stages based on the measurement of kidney function using eGFR (estimated glomerular filtration rate)

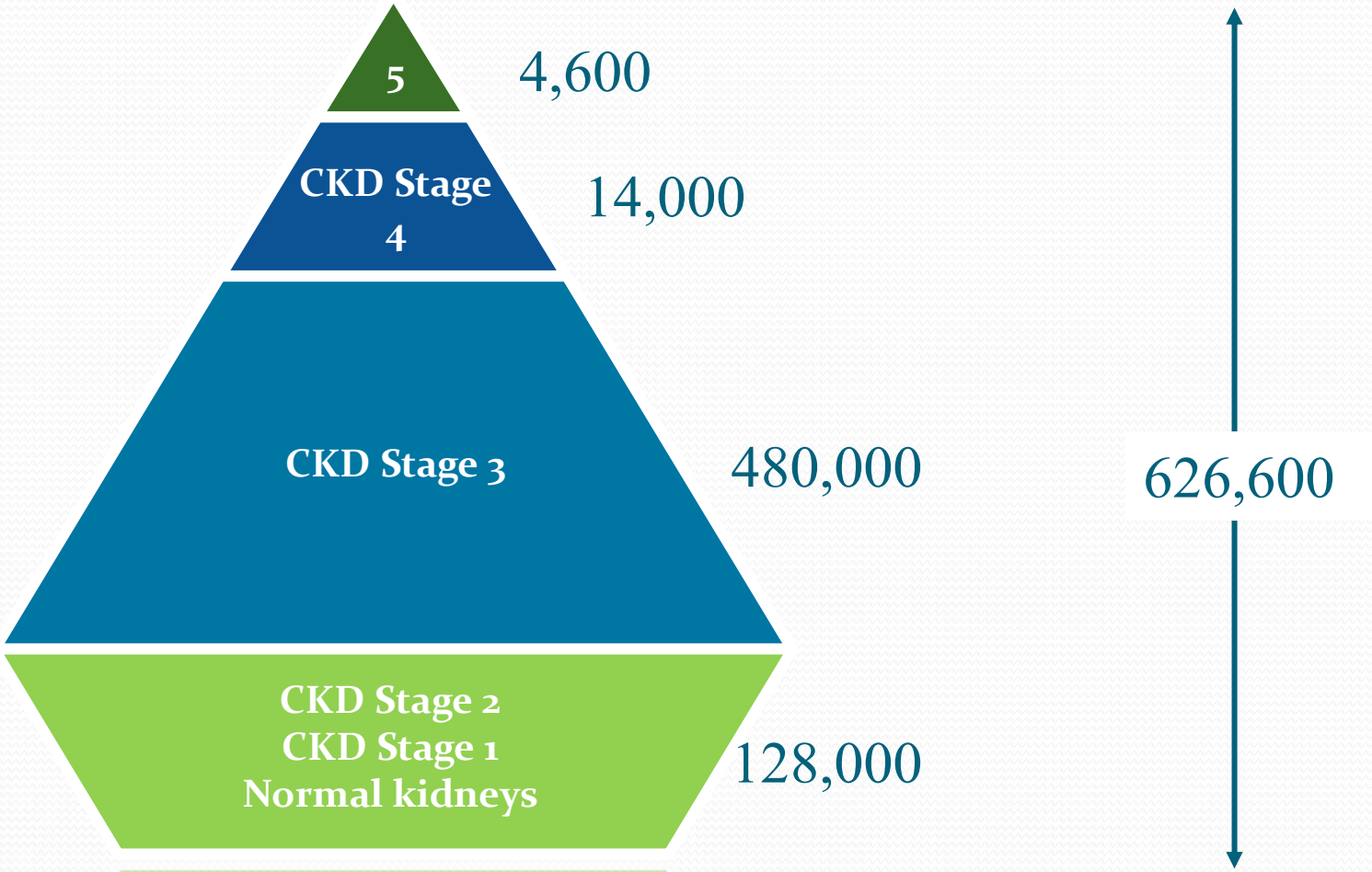
5 stages of Chronic Kidney Disease

Stage	Description	*eGFR (ml/min/1.73m²)
1	Kidney damage with normal or increased GFR	≥90
2	Kidney damage with mild GFR fall	60-89
3a 3b	Moderate fall in GFR	45-59 30-44
4	Severe fall in GFR	15-29
5	Established renal failure	<15 or dialysis

* eGFR=estimated glomerular filtration rate

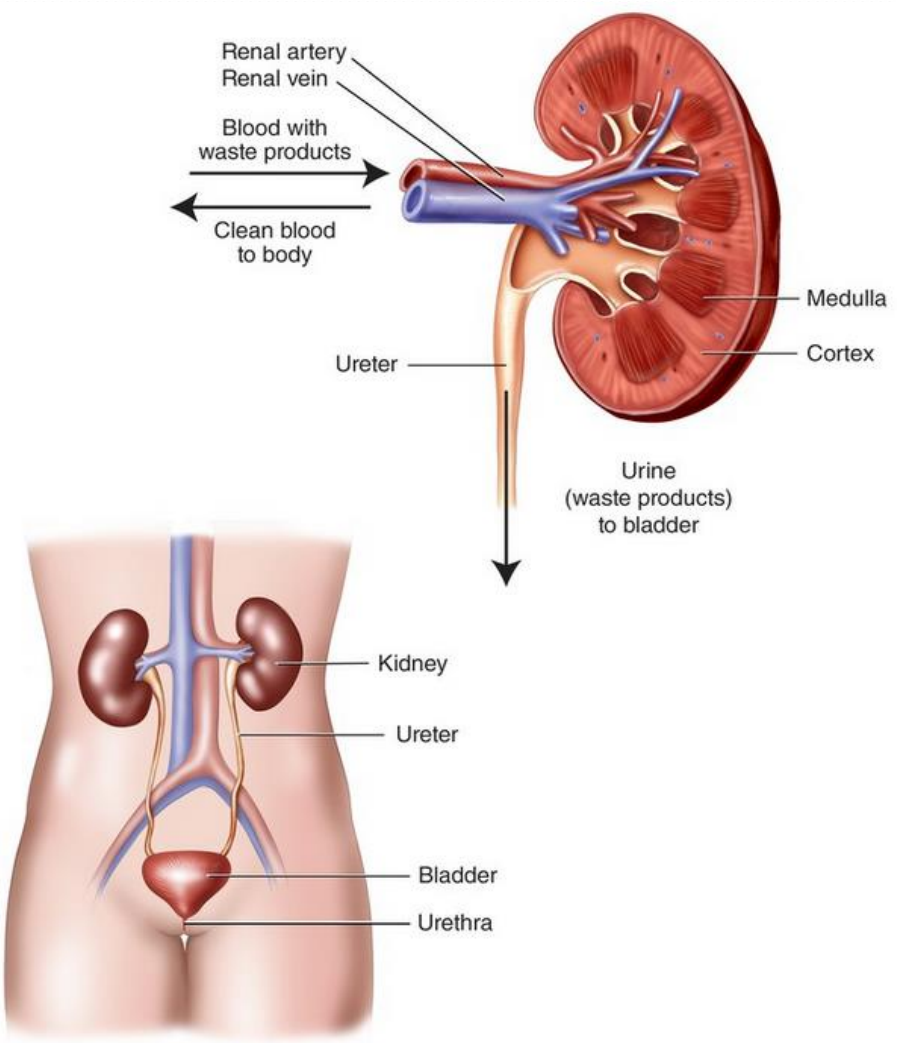
Johnson, 2012

CKD - Probable incidence in New Zealand



Adapted from various sources

What happens to the kidneys in CKD?



Most kidney diseases slowly damage the nephrons which causes them to lose their filtering capacity.

This leads to a loss of kidney function.

Kidney disease

Loss of function…	…leads to:
1. Excrete waste products of metabolism	Uraemia
2. Regulate body water composition (osmolality)	Body fluid imbalances
3. Regulate body electrolyte composition	Electrolyte disturbances
4. Regulate blood pressure (water volume)	Uncontrolled hypertension
5. Regulate acid base balance	Metabolic acidosis
6. RBC production	Anaemia
7. Vitamin D production	Hypocalcaemia &/or bone disease

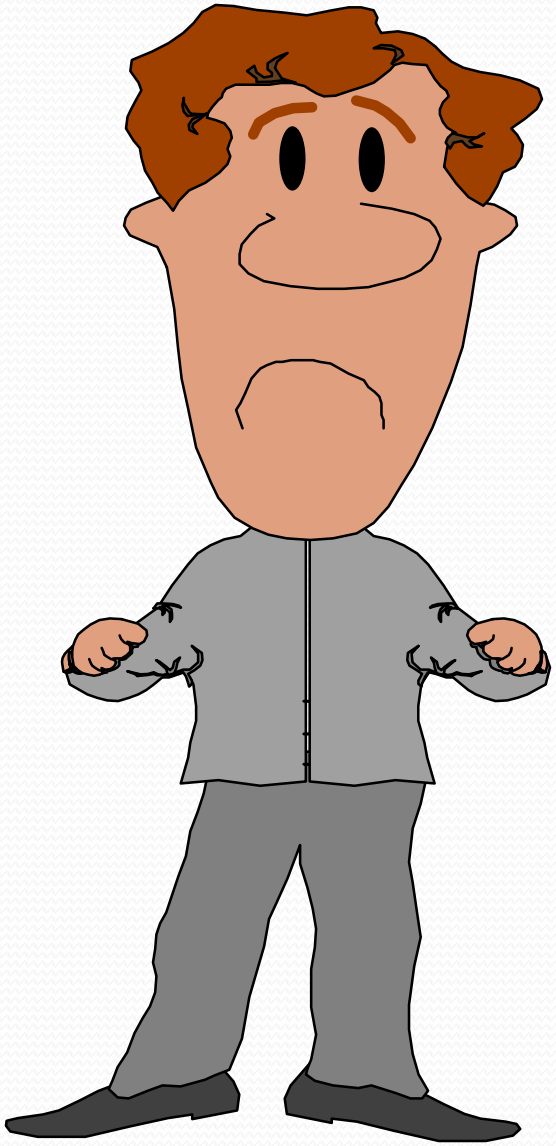
Chronic Kidney Disease…

Bone& Mineral Disorder
Vit D Deficiency, itch
calcification blood vessels
pathological fractures

Anaemia
LVH, CVD, lethargy,
SOB, inability to
concentrate

Peripheral Neuropathy
Numbness, restless legs,
tremor

Loss appetite/anorexia
Nausea/vomiting
Weight loss, GI bleeds



Fluid overload
Oedema, SOB, CVD,
Hypertension

Electrolyte Imbalance
High serum potassium
Confusion, cramps

Cardiovascular Disease
LVH, MI, CHF
Pericarditis

Acidosis
Poor cell function,
abnormal resps
fatigue, weakness,

Malnutrition
Poor healing,
increased risk of
infection

Kidney Disease in New Zealand

: as at 31st Dec 2017

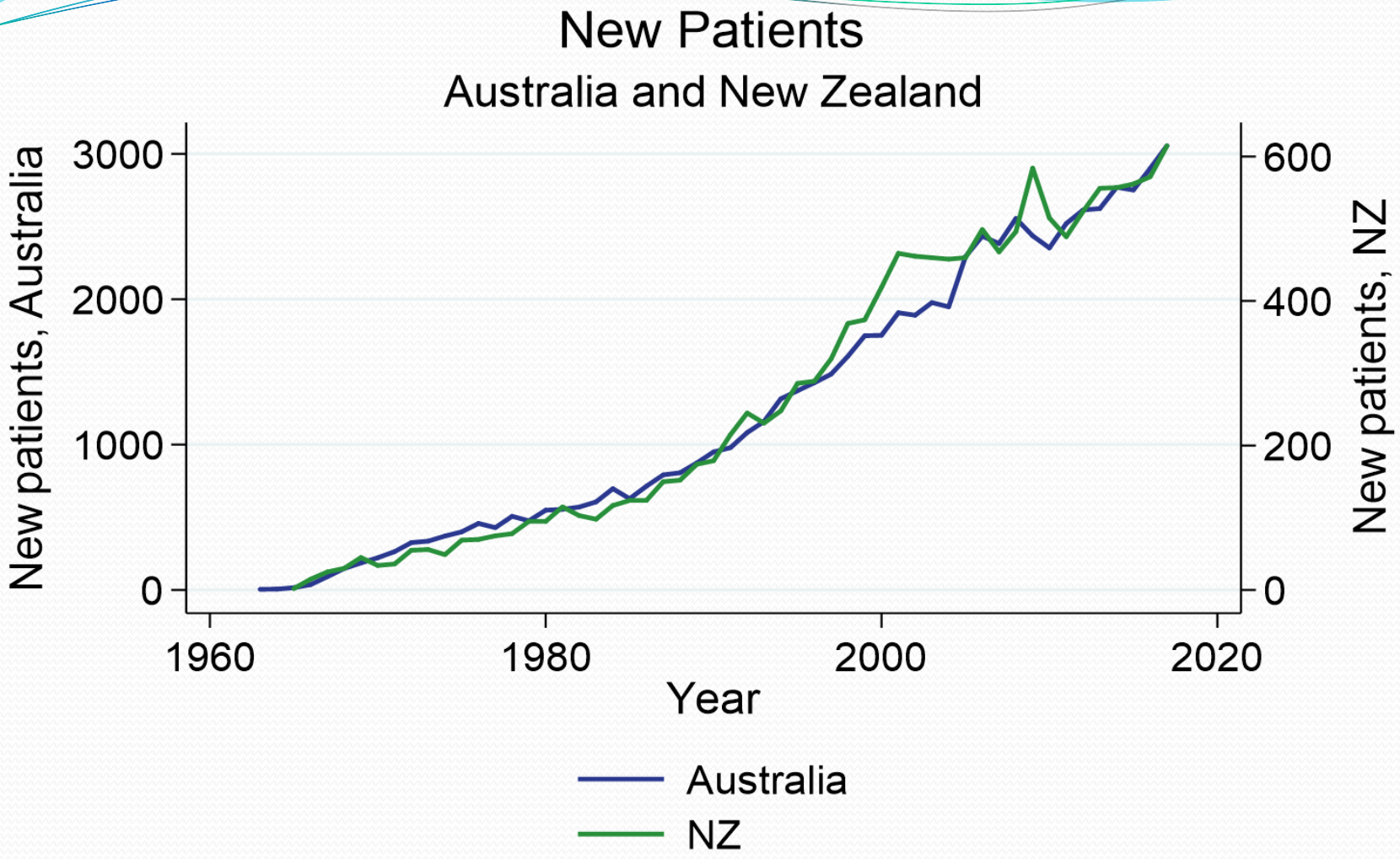
4,658 Renal Replacement Therapy

- 2768 on Dialysis
- 1890 functioning Kidney Transplants

- 187 Transplants in 2017 (69 live donor)

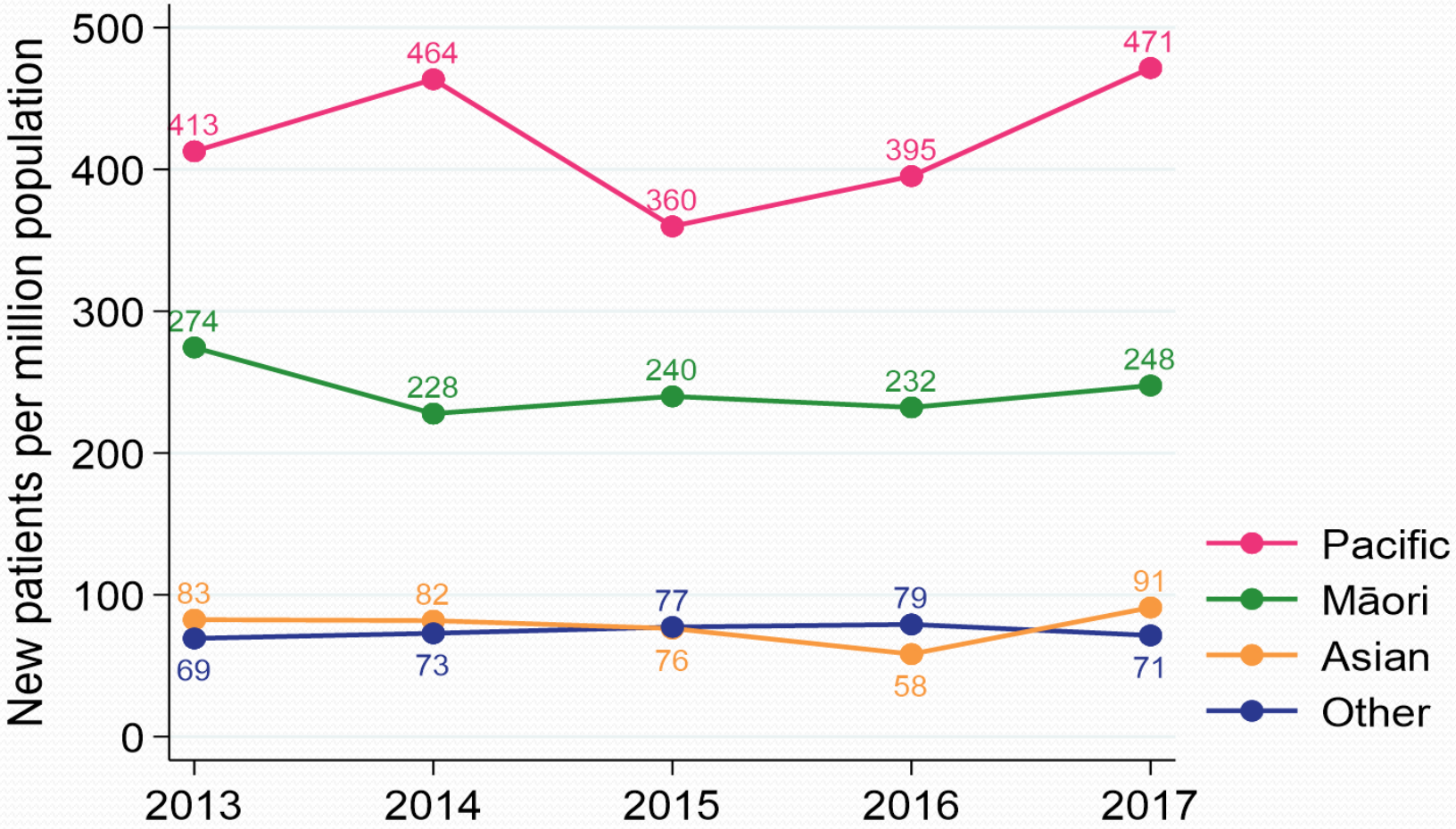
- 615 new dialysis patients in 2017

ANZDATA Registry Annual Report 2018



2018 ANZDATA Annual Report, Figure 1.1

Incidence of RRT by Ethnicity in New Zealand 2013-2017



2018 ANZDATA Annual Report, Figure 9.7

RRT= Renal replacement therapy (dialysis & transplantation)

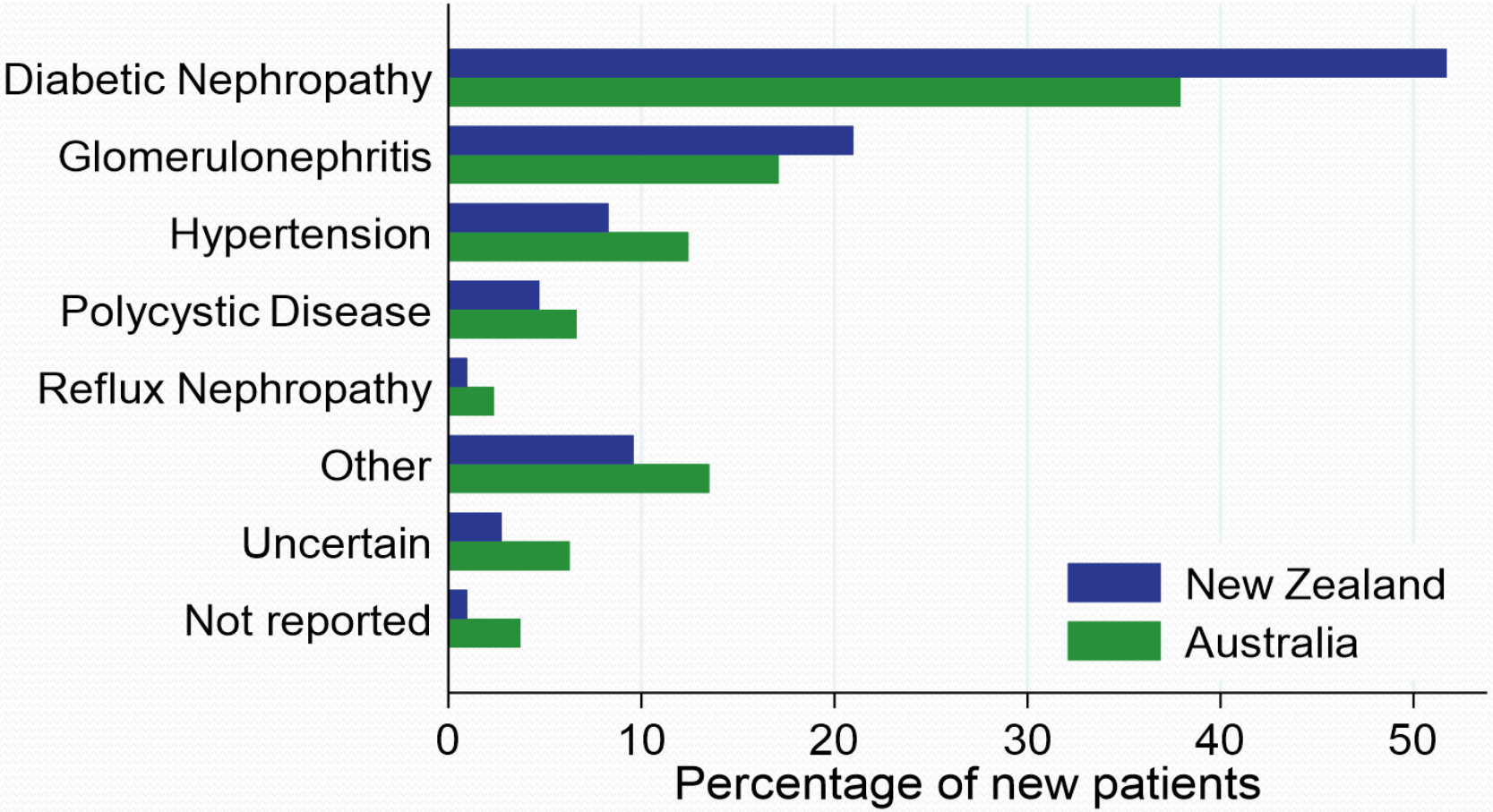
Causes of End Stage Kidney Disease

- Diabetic nephropathy 52%
- Glomerulonephritis 21%
- Hypertensive vascular disease 8%
- Polycystic kidney disease 5%
- Ureteric reflux 1%

- Tubulointerstitial disease e.g. Drug induced (antibiotics, NSAIDs, lithium, ciclosporin, PPIs)
- Obstructive uropathy e.g. prostatism
- Plasma cell disorders e.g. myeloma, amyloid nephropathy

ANZDATA Registry Annual Report 2018

Primary Renal Disease of New Patients Commencing Renal Replacement Therapy, 2017



2018 ANZDATA Annual Report, Figure 9.3

Diabetes as a cause of Kidney Disease

74% Pacific

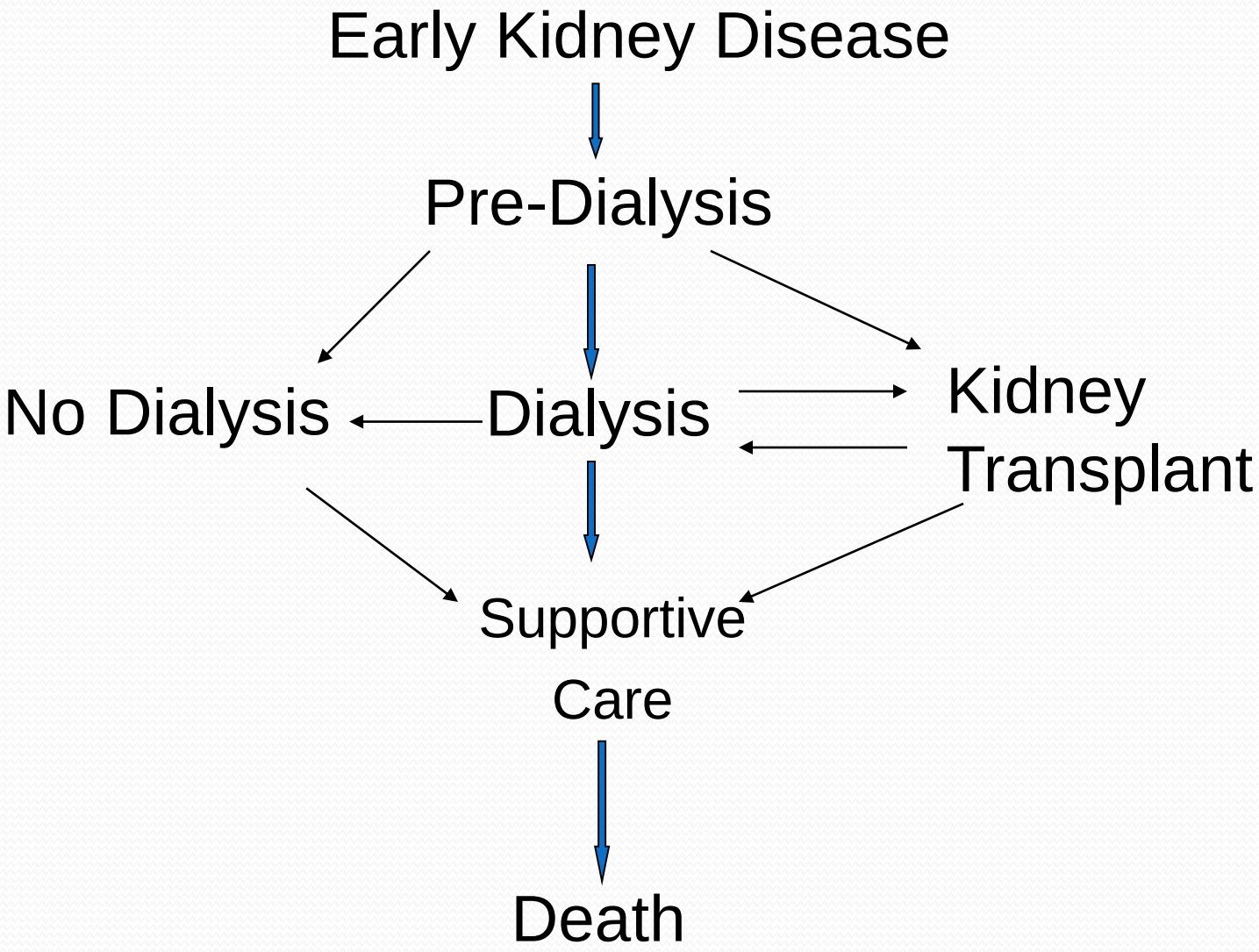
68% Maori

39% Asian

26% NZ or other European

ANZDATA Registry Annual Report 2018

The Chronic Kidney Disease Journey



Survival on dialysis is poor

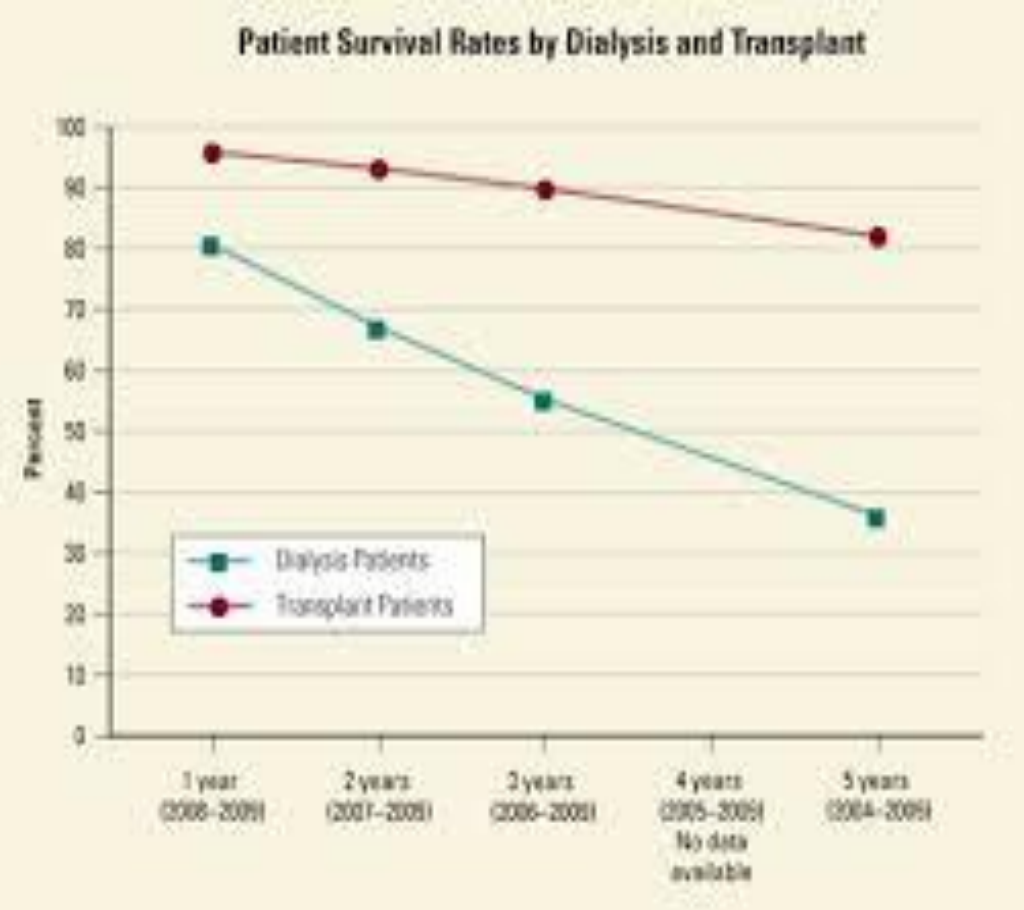
Survival (%) for people on dialysis, according to age at the start of dialysis

Age (years)	After one year	After two years	After five years
0-24	95	93	75
25-44	99	94	74
45-64	90	80	52%
65-74	84	71	34
75-84	76	54	20
Over 85	61	42	19

Source: Australia and New Zealand Dialysis and Transplant Register: www.anzdata.org.au

5 Year Survival Rates

Transplant - 85.5% Dialysis- 35.8%



The National Institute of Diabetes and Digestive and Kidney Diseases 2016 (NIDDK)

Treatment Options for End Stage Kidney Disease

- Dialysis:

  - Peritoneal Dialysis or Haemodialysis

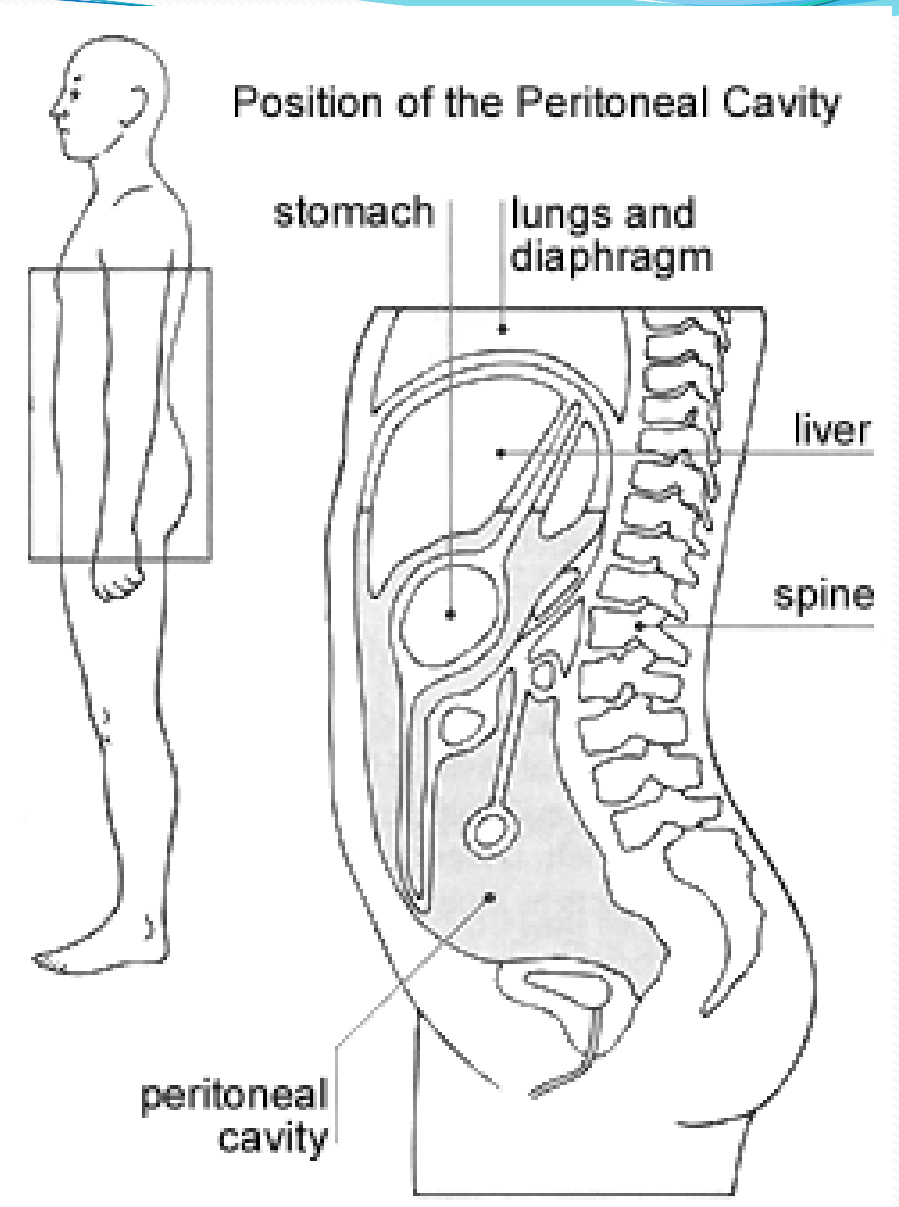
- Supportive care/ Palliative care

- Kidney Transplant

Peritoneal Dialysis

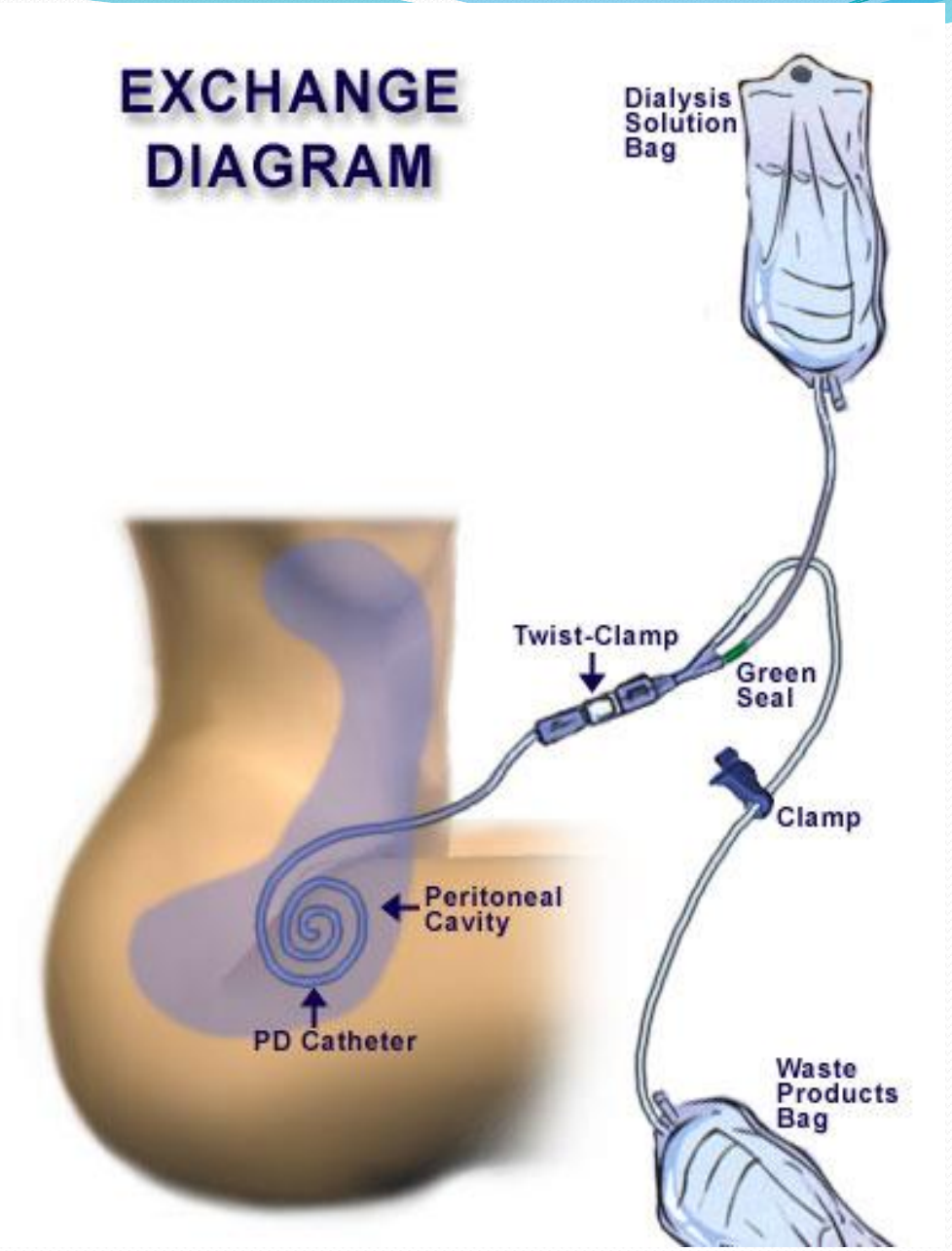
Uses the peritoneal membrane as a filter

- Diffusion
- Osmosis



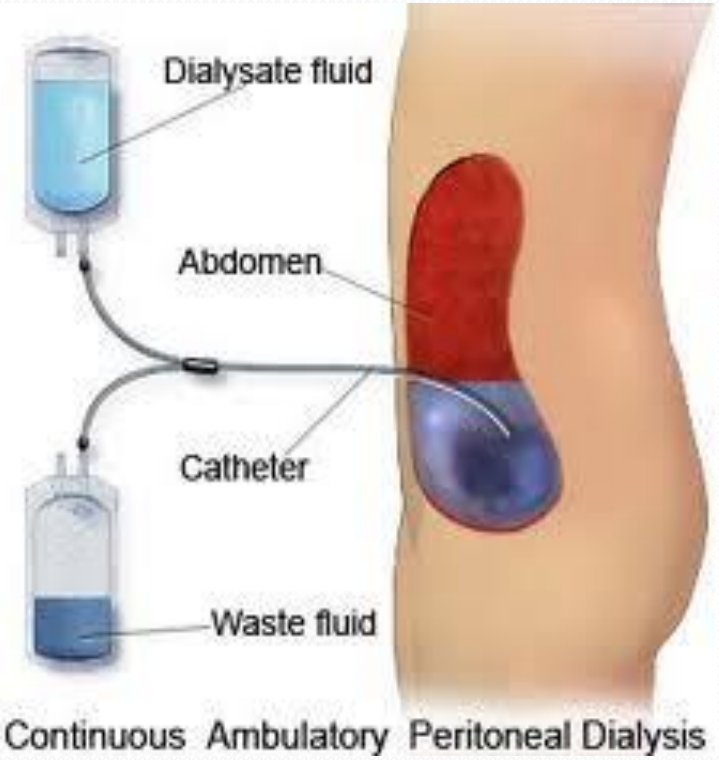
Peritoneal Dialysis

Tenckhoff catheter placement



Continuous Ambulatory Peritoneal Dialysis CAPD

4 Fluid exchanges per day
Approx 30 minutes per exchange



Automated Peritoneal Dialysis
APD

Overnight fluid exchanges

(about 9 hours every night)

Haemodialysis

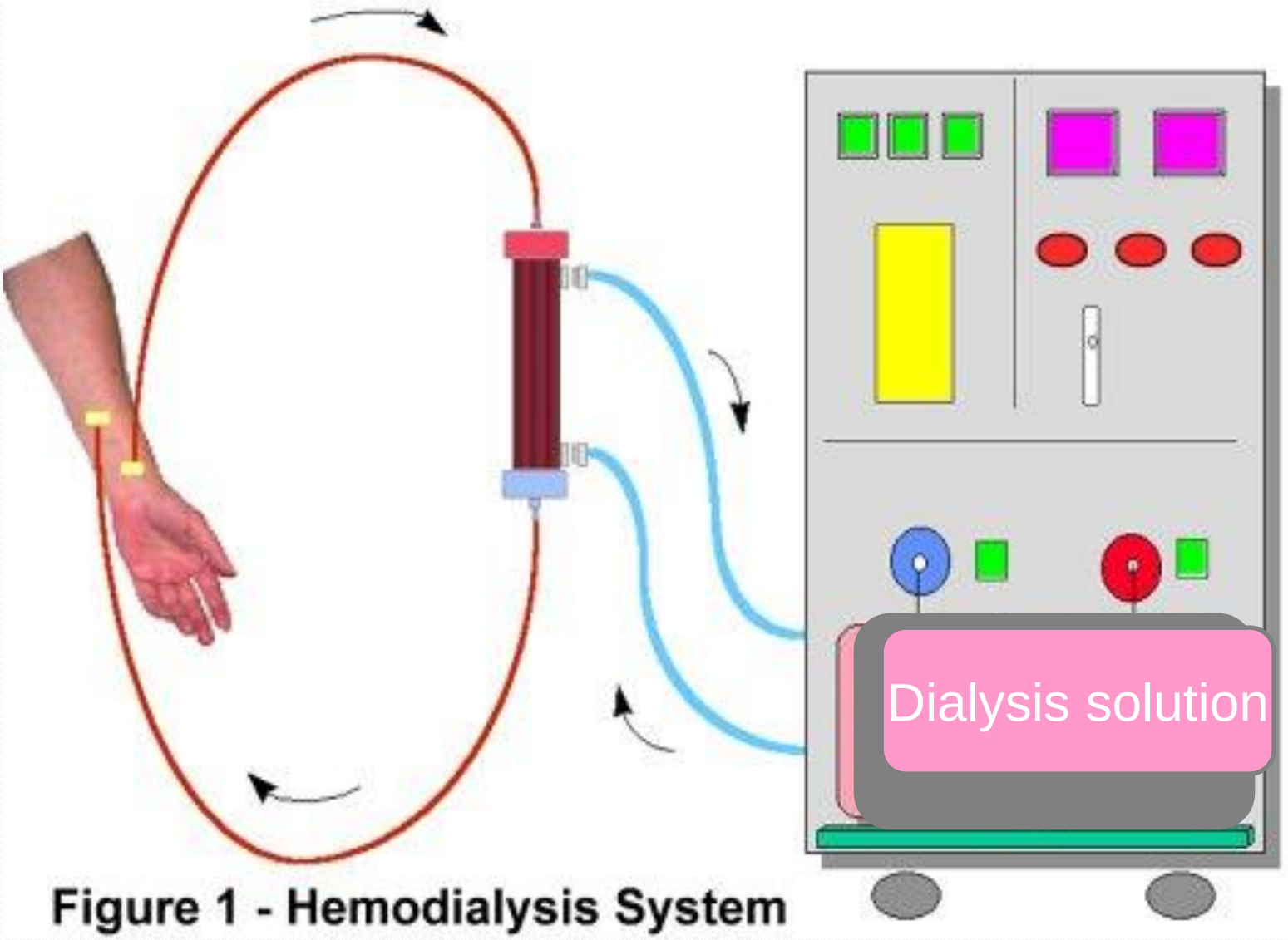


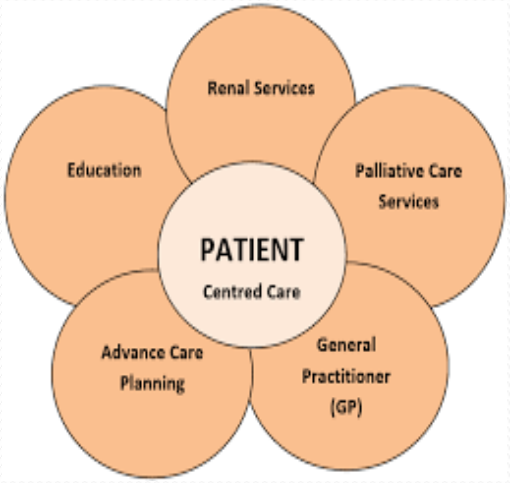
Figure 1 - Hemodialysis System

Haemodialysis

- 5 hours 3 times per week
- Need access to blood
- In-centre dialysis
- Community based dialysis
- Home dialysis (3 months training)

Supportive care or choosing not to do dialysis

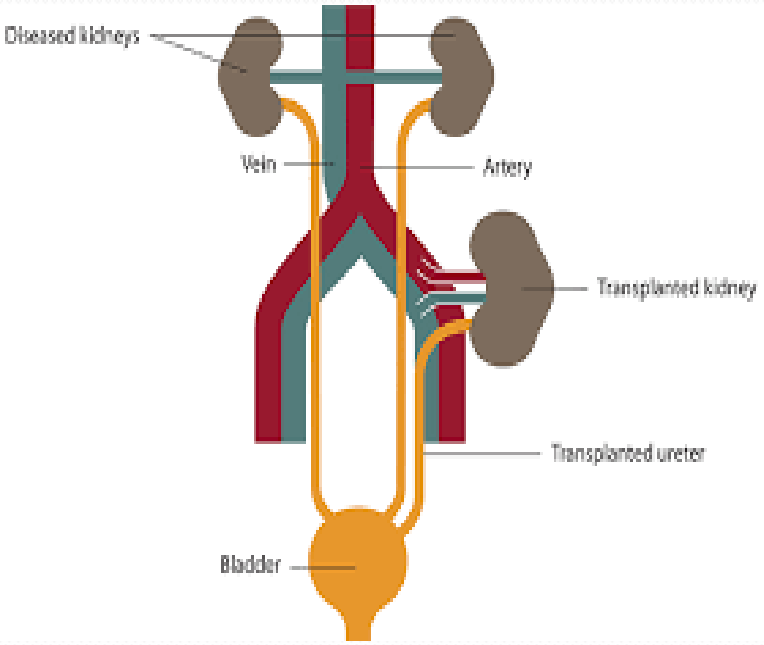
- **Active disease management** to preserve and maintain kidney function
- Assessment, education, support
- Ongoing follow up with renal team
- GP & community health involvement
- Referral to palliative care
- Symptom management

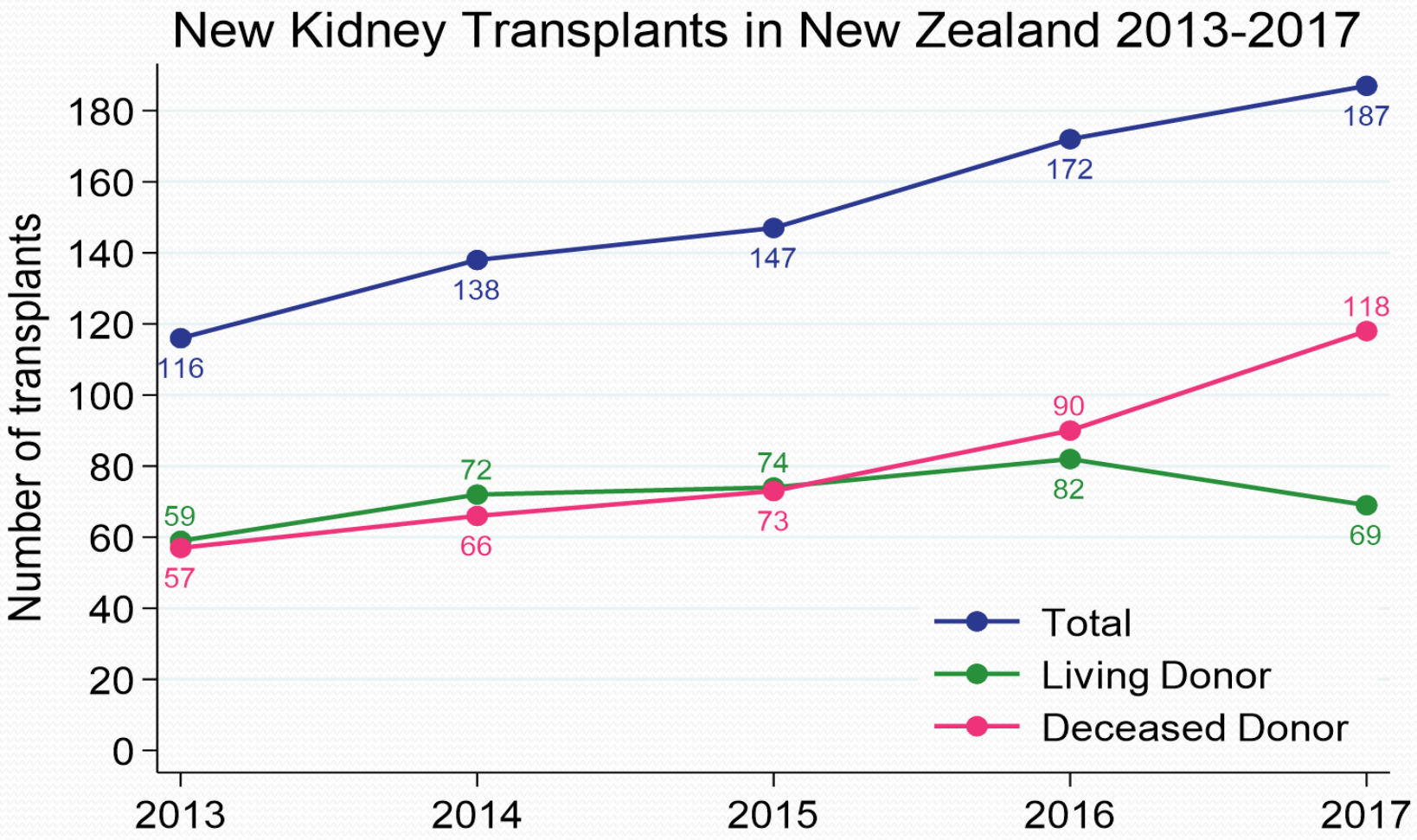


Kidney Transplantation

- Big operation
- Only about 15% total dialysis population on wait list
- Average 3-4 year wait
- Low rates for Maori & Pacific Island people
- Life time of anti-rejection drugs
- Greater chance of infection/cancer
- Always the risk of rejection

187 Transplants in 2017
- **69 living donor**
- **118 deceased donor**



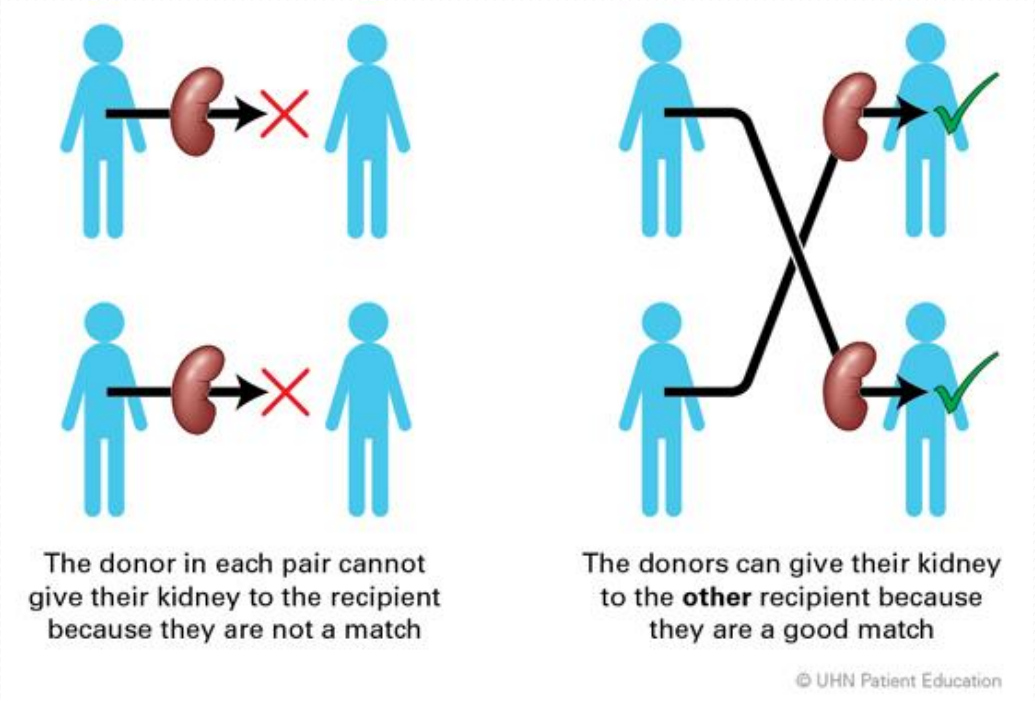


2018 ANZDATA Annual Report, Figure 9.17

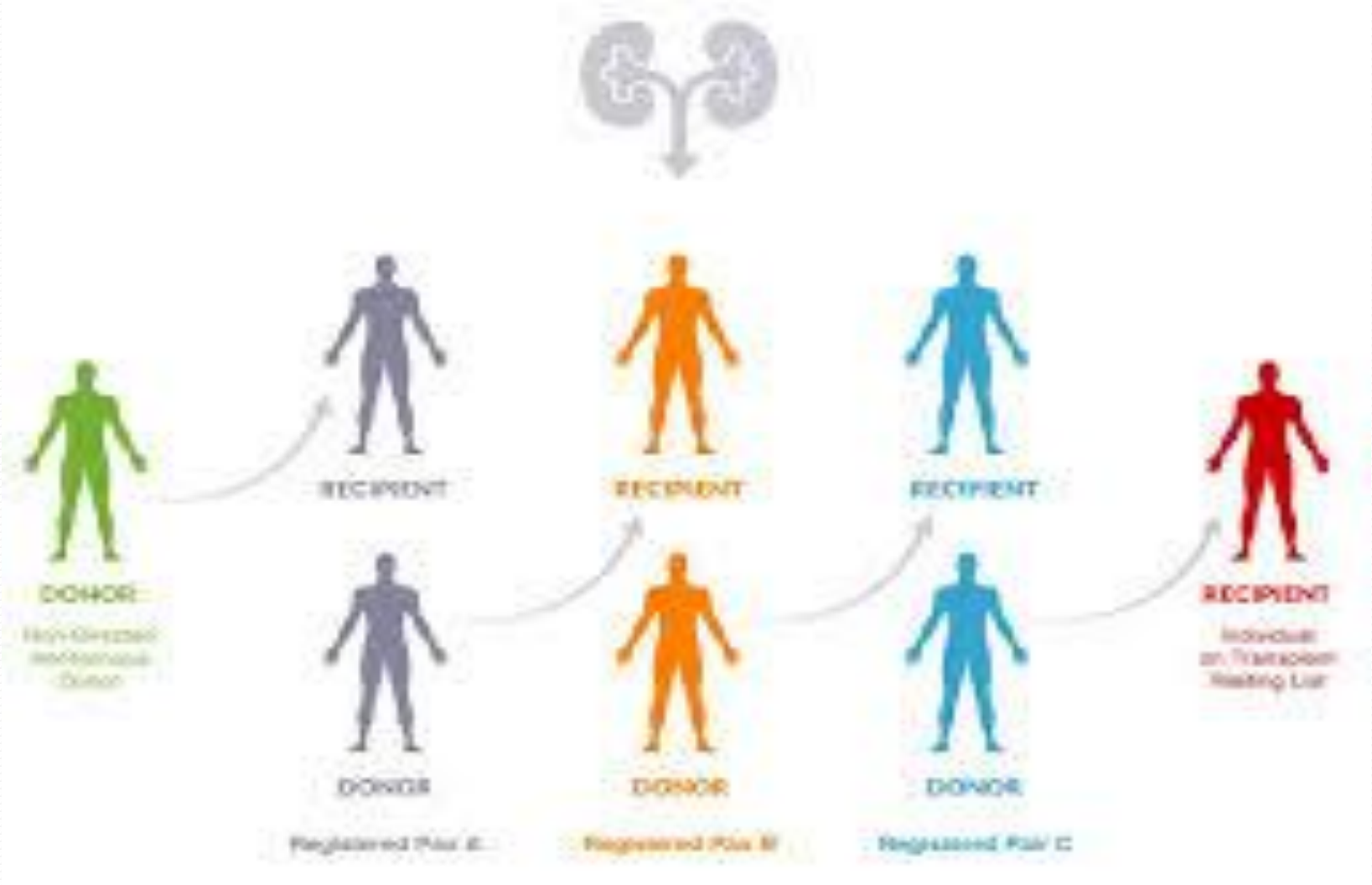
Kidney Transplantation

- Live donor (including ABO incompatible)
  - *91% five year survival*
- Deceased donor
  - *80% five year survival*

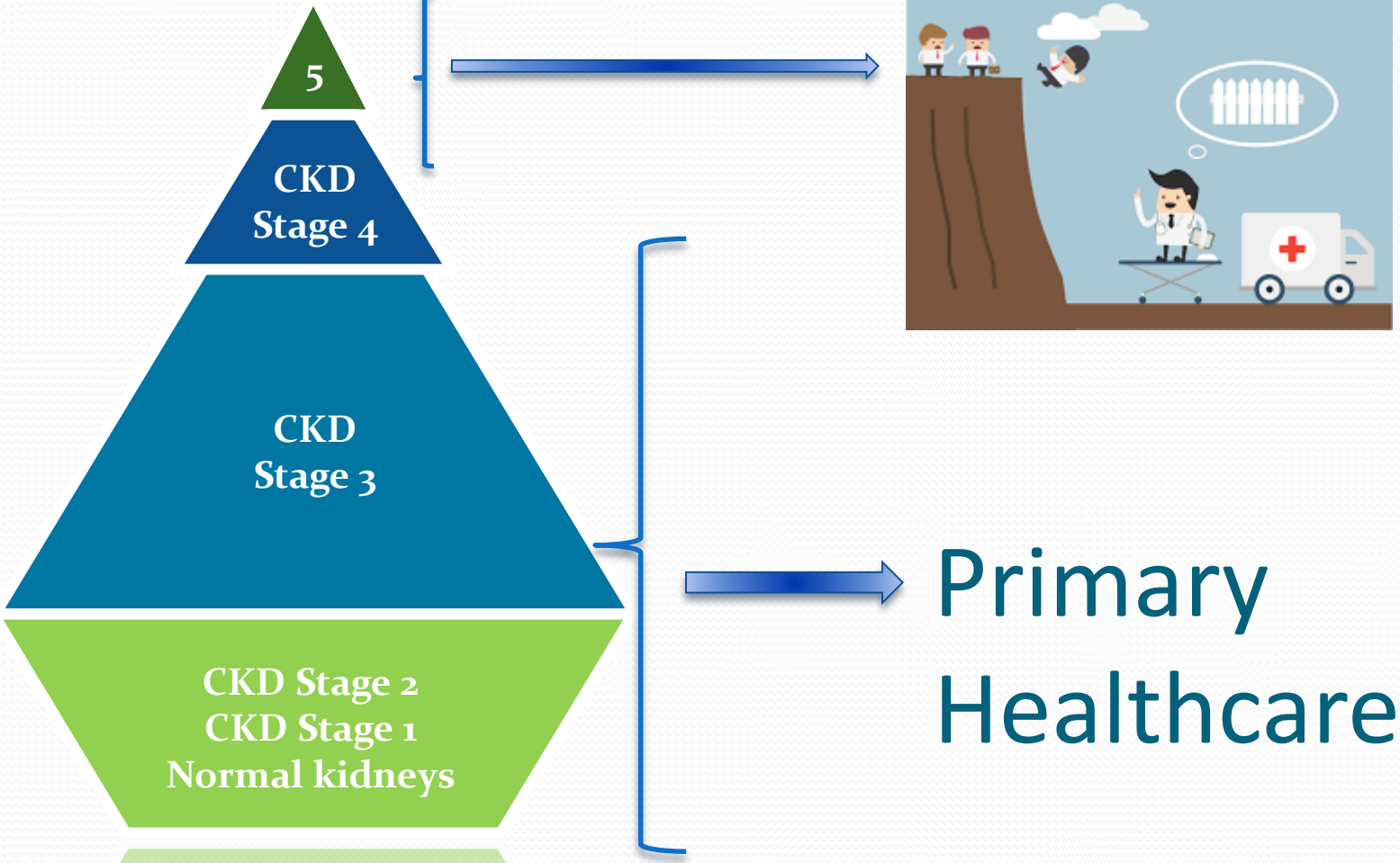
- Paired kidney exchange



Paired Kidney Exchange Programme



Management of CKD in NZ



Why Identify CKD Early?

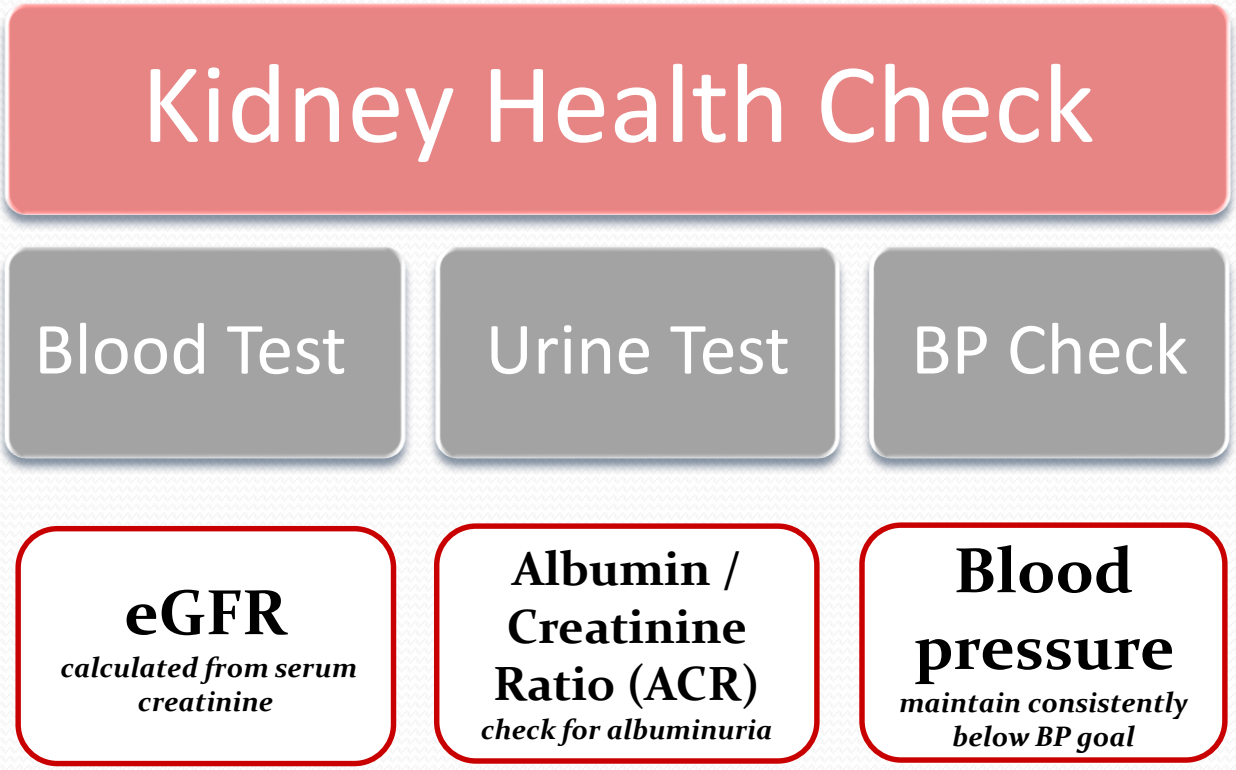
- ESRD increasing at 4 - 6% pa
- Doubling of dialysis numbers every 13 yrs
- Once symptomatic (GFR ~ 20mL/min) then kidney failure inevitable and complications already apparent (CVD, bone disease, anaemia)
- Late referral associated with increased costs, morbidity and reduced survival

Risk factors for kidney disease

- Diabetes
- Hypertension
- Established cardiovascular disease
- Family history of kidney failure
- Obesity (BMI >30kg/m2)
- Smoker
- Maori, Pacific or South Asian origin
- History of acute kidney injury
- Over 60 years of age

1 in 3 New Zealand adults is at increased risk of CKD due to these risk factors

Kidney Health Check



CKD screening should be undertaken as a part of every chronic disease & cardiovascular risk assessment

CKD Management
Lifestyle modification

Lifestyle approaches are the first consideration - the key elements are:

SNAP - smoking, nutrition, alcohol, physical activity

- Stop smoking
- A low salt diet
- A reduction in alcohol intake
- An exercise program
- A low calorie diet to reduce BMI

CKD Management

- **Blood Pressure**
  - <130/80 mmHg
  - <125/75 mmHg if proteinuria (>1g)
  - Use ACEi / ARB first line
  - Likely to need multiple agents

CKD Management

- **Proteinuria**:
  - Aim to reduce by >50%
  - ACEi / ARB
- **Lipids** – CVD guidelines:
  - Total cholesterol target < 4.0
  - LDL < 2.0
  - HDL > 1.0
  - Triglycerides < 1.7
- **Glucose control**:
  - Target HbA1c 50 -55 mmol/mol

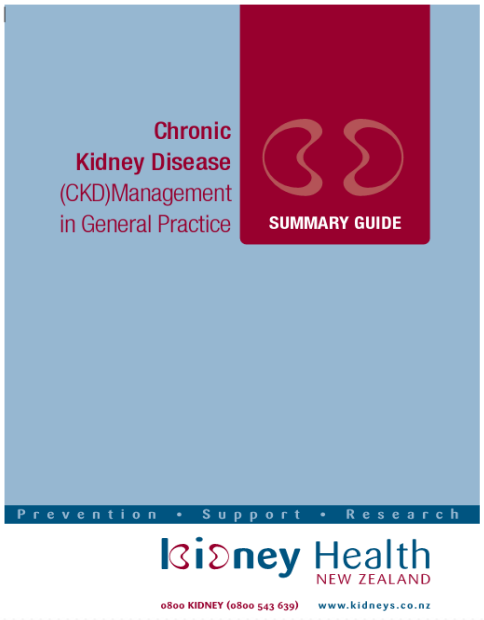
CKD Management- cont.

- **Treat gout:**
  - Uric Acid <0.36 mmol/L

- **Prevent bone disease:**
  - Calcium & Phosphate control
  - Vit D supplementation
  - Parathyroid hormone suppression

- **Prevent anaemia :**
  - Iron replacement
  - Erthyropoeitin injections

- Timely referral to renal team
- Preparation for dialysis/transplant



Medicines To Be Wary Of

- NSAIDs (esp. with ACEi & diuretics) 'Triple Whammy'
- Methotrexate
- Lithium
- Proton pump inhibitors
- Statins & Fibrates
- Antibiotics (e.g. aminoglycosides)
- Metformin
- IV contrast (Iodinated contrast agents)
- Some herbal medicines e.g bucha leaves, juniper berries

Rainey,H. (2019). Managing chronic kidney disease in primary care. *Nurse Prescribing,* 16 (11), 542 -548

CKD patients who are best managed in primary care

- Stable stage 3 CKD (eGFR 30- 60ml/min)
- Elderly CKD patients (>75 years)
- Absent heavy proteinuria with no haematuria
- Focus on BP control and CVD risk
- Avoidance of nephrotoxins

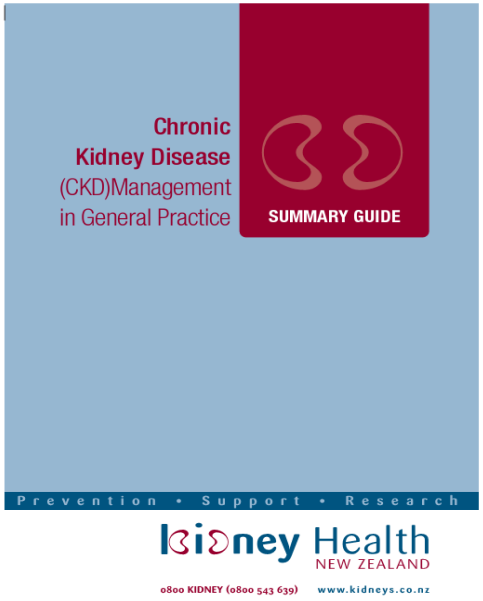
BPJ: The detection and management of patients with chronic kidney disease in primary care, Issue 66, p37 – 44.

Key Points

- Identification of patients with CKD is now common
- Useful for identifying patients:
  - At risk of drug toxicity
  - At increased cardiovascular risk
  - At risk of progressive CKD
- Proteinuria is a major prognostic marker & an important treatment target
- **Diabetic Kidney Disease is preventable & treatable**

Useful Resources

- www.kidneys.co.nz
- bpac (2015) 'The detection and management of patients with chronic kidney disease in primary care', Issue 66, p 36-44.
- Bpac (2019) 'Slowing progression of renal dysfunction in patients with diabetes' June 2019, www.bpac.org.nz/2019/renal.aspx
- Rainey, H. (2019). Managing chronic kidney disease in primary care. *Nurse Prescribing, 16 (11), 542-548*



'The kidney has a special place in the heart'

10th July 2019

Thank you