**Chapter 4 Learning App: video outline – screening for diabetic kidney disease**

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| Chapter: Preventing and managing complications of diabetes | Presenter: Prof. Kamlesh Khunti |
| Lesson: There are multiple tests for diagnosing diabetic kidney disease | Video type: Expert commentary |
| Video title: Screening for diabetic kidney disease | Video shot: faculty straight to camera, positioned right or left. Animations to appear over shoulder and/or as full screen overlay where appropriate. |
| Video objective: To provide practical guidance on nephropathy screening and staging of CKD in people with T2D | Video setting: Self-filming in clinic or office |
| Video length: Approx 4-5 minutes | |

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| **Topic 1: Understanding nephropathy**  **Duration of topic: 1 minute** | | | |
| **Talking points/script** | **Animation (if applicable)** | **Timings** | **References** |
| * The role of the kidneys is to filter and clean blood to remove waste products. They are also responsible for reabsorption of water, glucose and proteins. * Nephropathy is a common microvascular complication of diabetes associated with a persistent decline in kidney function. * It is common in people with diabetes because **hyperglycaemia causes damage to the kidneys** making it possible for larger molecules such as albumin to pass through the capillary walls and be excreted via urine. * **Kidneys that are working optimally do not excrete albumin**, a protein found in the blood, into urine. * **Albuminuria**, or the excess of albumin in urine, **is therefore, characteristic of nephropathy or diabetic kidney disease**. Higher concentrations of albumin in urine are associated with worsened kidney function. | The video will be a combination of full screen talking head and over the shoulder talking head with on screen animations.  Keywording: text screens depicting keywords highlighted in blue on the left | TBC in post-production |  |
| **Topic 2: How to screen for nephropathy**  **Duration of topic: 2 minutes** | | | |
| **Talking points/script** | **Animation (if applicable)** | **Timings** | **References** |
| * The early stages of albuminuria and nephropathy tend to be ‘clinically silent’, meaning that no overt symptoms are present. * **Individuals with diabetes should, therefore, be screened regularly to detect signs of nephropathy early**. * For most people, this means screening annually. Some people at high risk may need to be screened more often. * Screening tests include **estimated glomerular filtration rate** and **serum or urine albumin levels**. Where possible, both tests should be carried out for greater prognostic and diagnostic ability. * Urinary albumin excretion can be estimated in a spot urine sample using various tests. The preferred test is **urine albumin-to-creatinine ratio**. If this test is not available, other tests include:   + **urine protein-to-creatinine ratio**   + reagent strip **(dipstick) urine analysis** for automated reading of albumin or total protein   + reagent strip (dipstick) urine analysis for manual reading of albumin or total protein. * Dipstick urine testing for albumin has a high rate of false-negative and false-positive results so these tests should be avoided if others are available, especially for diagnosis. * Slightly increased levels of albuminuria are described as **microalbuminuria (30–300 mg/g)** and significantly increased levels of albumin in urine are described as **macroalbuminuria (>300 mg/g)**. * Glomerular filtration rate is another method used to understand how well the kidneys are functioning. * Tests to measure individual glomerular filtration rate are not widely available so most clinicians rely on **estimated glomerular filtration rate (or eGFR)** which is calculated using serum creatinine levels, measured via a blood test. There are many calculators available online for calculating eGRF. | Keywording: text screens depicting keywords highlighted in blue on the left |  | <https://pubmed.ncbi.nlm.nih.gov/8366922/>  <https://pubmed.ncbi.nlm.nih.gov/9742976/>  <https://pubmed.ncbi.nlm.nih.gov/10938048/> |
| **Topic 3: Diagnosing and staging diabetic kidney disease**  **Duration of topic: 3 minutes** | | | |
| * An individual’s risk of diabetic kidney disease can be calculated by looking at the level of albuminuria and/or their estimated glomerular filtration rate. * A normal eGFR is ≥90 ml/min per 1.73 m2. Individuals with a low risk of diabetic kidney disease will have a high eGRF and low-to-no levels of albuminuria. * A diagnosis of kidney disease can be made based on having an estimated glomerular filtration rate of **<60 ml/min per 1.73 m2 and/or the presence of albuminuria in at least two urine samples**, 1 to 3 months apart. * eGRF naturally declines with age. Individuals with an **eGFR of 60–90 ml/min/1.73m2** have mildly reduced kidney function which may be appropriate for their age. These stages are considered **stages G1 and G2** and individuals at this stage typically only need regular testing to assess progress. Some cases such as rapidly worsening eGFR and young age warrant referral to specialist at this stage as they may indicate likely progression to end-stage renal failure. * Individuals with an **eGFR of 30–59 ml/min/1.73m2** **are at stage G3** which is divided into G3a and G3b. When combined with a micro- or macroalbuminuria this suggests a high risk of nephropathy. * Those with an eGFR of **15-29 ml/min/1.73m2 have CKD stage G4** which represents significant impairment of kidney function. **Stage G5 or eGFR <15 ml/min/1.73m2**is referred to as end-stage renal failure, even when combined with a normal albumin-to-creatine ratio. * Before diagnosing an individual with diabetic kidney disease, consider and rule out transient causes of albuminuria such as **urinary tract infections** and **glomerular conditions**. Glomerular conditions may be difficult to diagnose in primary care so all individuals with micro- or macroalbuminuria and those with an eGFR <60 ml/min/1.73 m2 if combined with albuminuria should be **referred to higher levels of care** for specialist assessment. * Often, people with diabetes need **medication dosage adjustment** as their kidney function declines. Diabetes medications, including metformin and SGLT2 inhibitors need to be adjusted depending on an individual’s eGFR stage. | Animations of screen using a figure similar to below. Relevant parts will be circled or highlighted when discussed. |  |  |
| **Topic 4: Summary**  **Duration of topic: 1 minute** | | | |
| * Diabetic kidney disease is a **common complication** that affects many people living with diabetes. * Because of this, people with **diabetes should be regularly screened** to assess their kidney function. For most people, once yearly screening is appropriate. * Screening tests include **estimated glomerular filtration rate**, which requires a blood test for serum creatinine levels, and urine samples to determine rates of albumin excretion. Where possible, both urine and serum tests should be carried out. * Individuals with suspected diabetic kidney disease should be **referred to specialist care** for further investigation and treatment. |  |  |  |