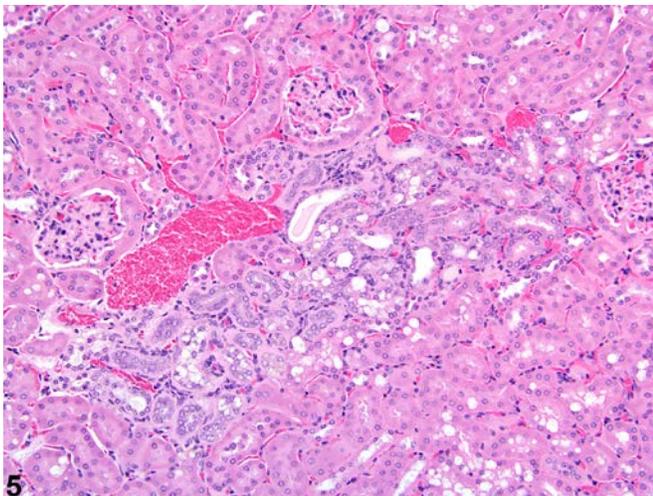
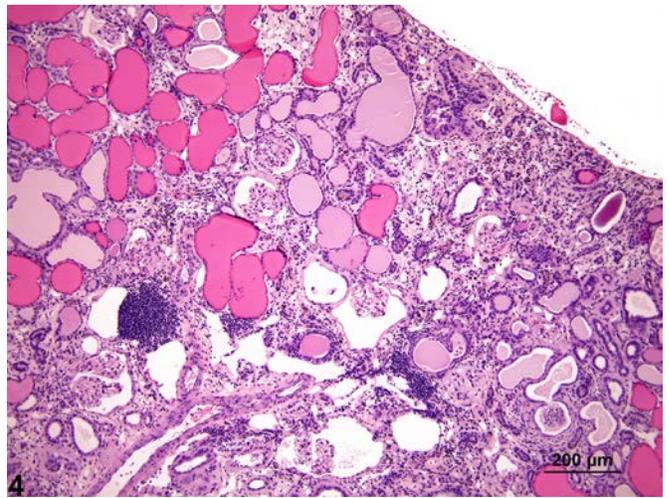
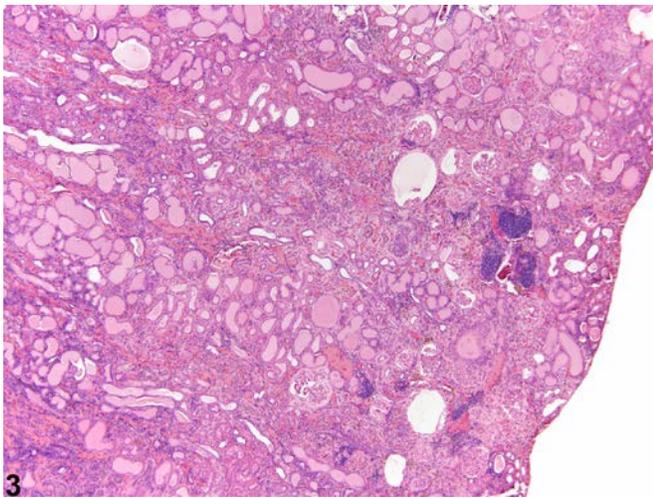
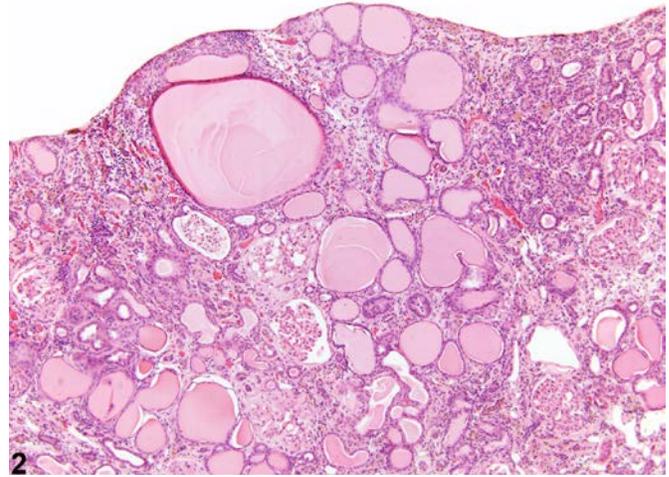
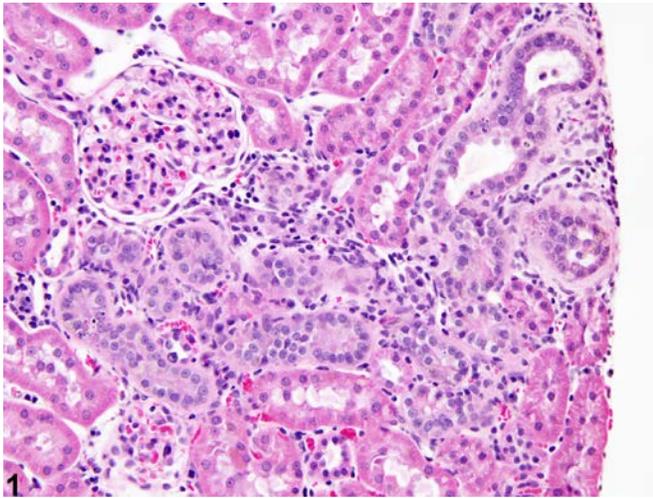
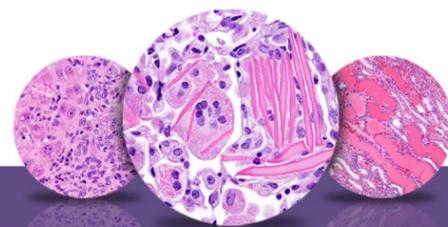


NTP Nonneoplastic Lesion Atlas

Kidney – Nephropathy, Chronic Progressive





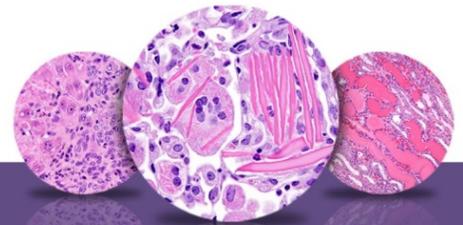
NTP Nonneoplastic Lesion Atlas

Kidney – Nephropathy, Chronic Progressive

Figure Legend: **Figure 1** Kidney - Nephropathy, Chronic progressive in a male F344/N rat from a subchronic study. The early cases of chronic progressive nephropathy (CPN) occur as focal to multifocal areas of tubule basophilia with or without hyaline (protein) casts. **Figure 2** Kidney - Nephropathy, Chronic progressive in a male F344/N rat from a chronic study. This is a more severe case of CPN with prominent hyaline casts. **Figure 3** Kidney - Nephropathy, Chronic progressive in a male F344/N rat from a chronic study. As the severity of CPN progresses, all components of CPN become more prominent, with nearly all of the renal parenchyma involved. **Figure 4** Kidney - Nephropathy, Chronic progressive in a male F344/N rat from a subchronic study. CPN may become quite severe, leading to an “end-stage” kidney with little normal parenchyma remaining. **Figure 5** Kidney - Nephropathy, Chronic progressive in a male B6C3F1 mouse from a subchronic study. Though usually less severe, CPN has a similar appearance in mice.

Comment: Chronic progressive nephropathy, or CPN, is one of the most common spontaneous lesions and the single most important renal disease in rats and mice. The etiology of CPN is unknown, but factors such as strain, sex, age, diet, and hormones may modulate its occurrence and severity. The incidence and severity of CPN are generally greater in rats than in mice, and male rats are more severely affected than female rats. Nephropathy is both a degenerative and regenerative disease with characteristic morphology that is age dependent. It is a progressive disease and can lead to chronic renal failure and death. Early lesions can be seen in 2- to 3-month-old animals; by the end of 90-day studies, it is commonly observed in nearly all male rats.

Early lesions consist of focal to multifocal foci of tubule basophilia, nuclear crowding, peritubular basement membrane thickening, and variable infiltration by mononuclear inflammatory cells (Figure 1). As the disease progresses, the amount of affected renal parenchyma increases, individual components of CPN become more severe, and hyaline casts are prominent (Figure 2 and Figure 3). At the same time, glomerular changes, such as capillary tuft thickening, adhesions between the glomerular epithelium and Bowman’s capsule, and glomerulosclerosis, may be evident. CPN may progress to end-stage kidney disease, resulting in the death of the animal (Figure 4). CPN can often be exacerbated by chemical administration. The incidence and severity of CPN are generally less in the mouse than in the rat (Figure 5).



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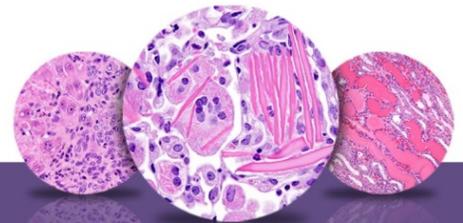
Kidney – Nephropathy, Chronic Progressive

CPN is often accompanied by hyperplasia of the lining epithelium of the renal papilla. It is important to know that in advanced stages of CPN, there may be a small but significant increase in the incidence of proliferative lesions of the proximal tubule. Nephropathy is a bilateral lesion and differing severities of nephropathy between the two kidneys is rarely noted.

Recommendation: CPN should be diagnosed and graded according to the extent and severity of the lesion. Currently, there are no universally accepted recommendations for assigning a severity grade to CPN. However, some published guidelines have been reported, and each pathologist may use his or her own criteria, based on training and experience, to achieve consistent grading. However, if CPN is reported as a potential treatment-related finding, then the pathologist should clearly define the severity and severity grading in the pathology narrative. It is not recommended to grade the separate components of nephropathy.

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NTP Nonneoplastic Lesion Atlas

Kidney – Nephropathy, Chronic Progressive

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