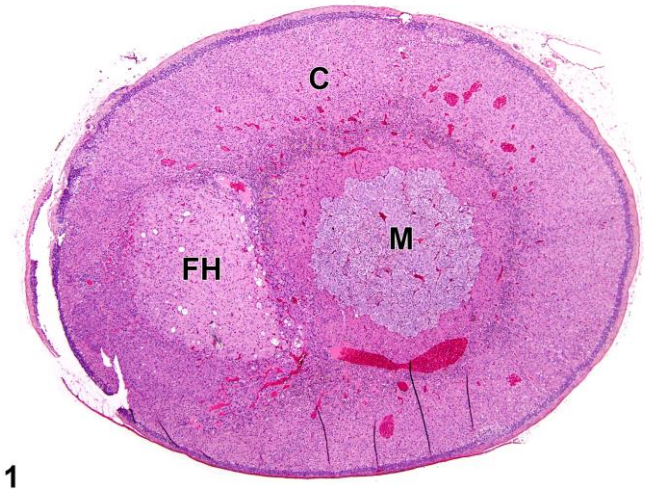
Adrenal Gland, Cortex – Hypertrophy



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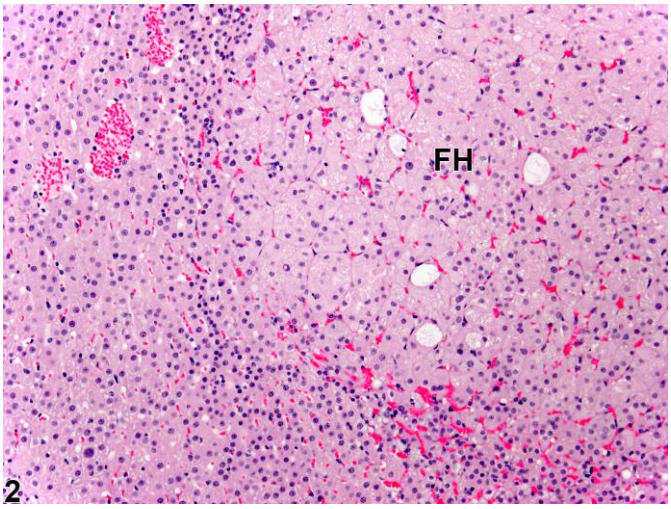

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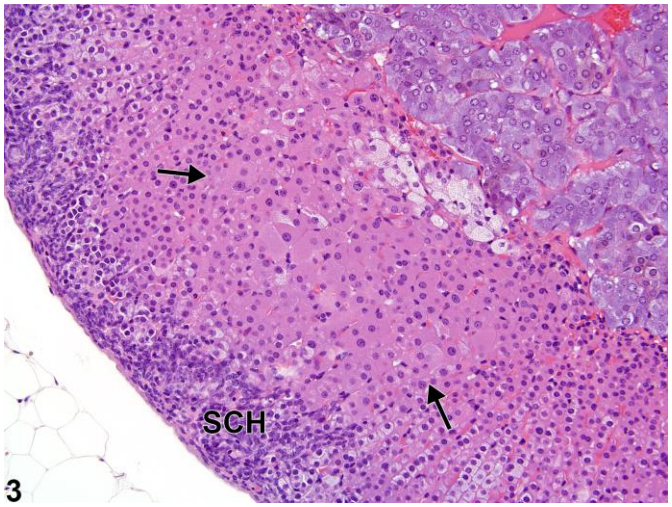

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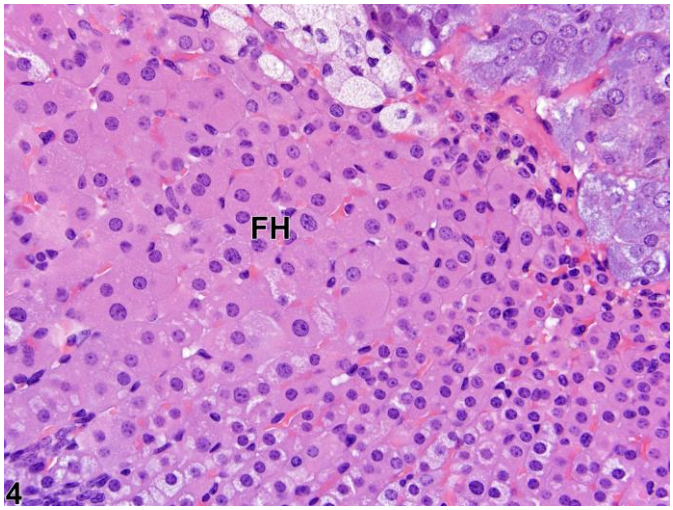

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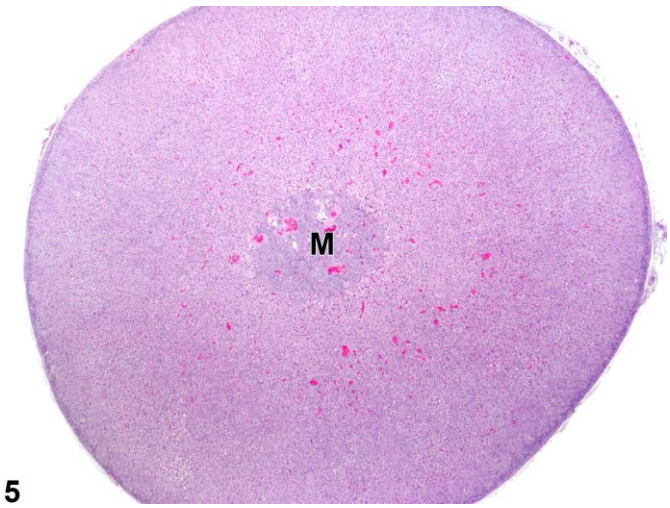

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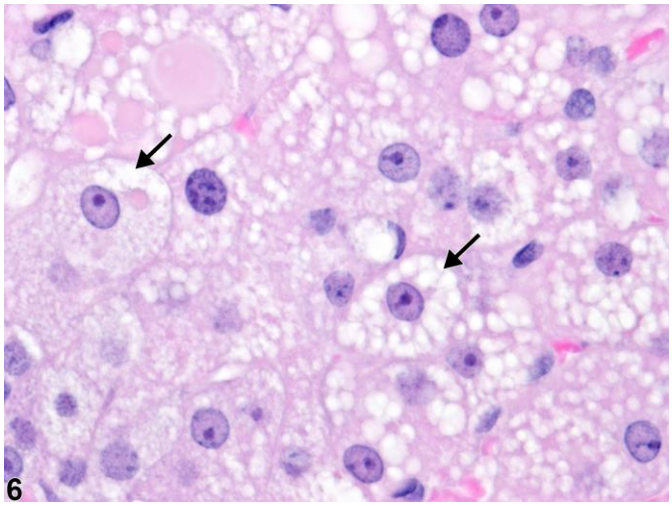
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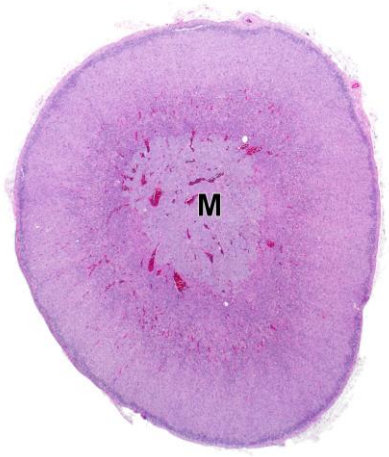

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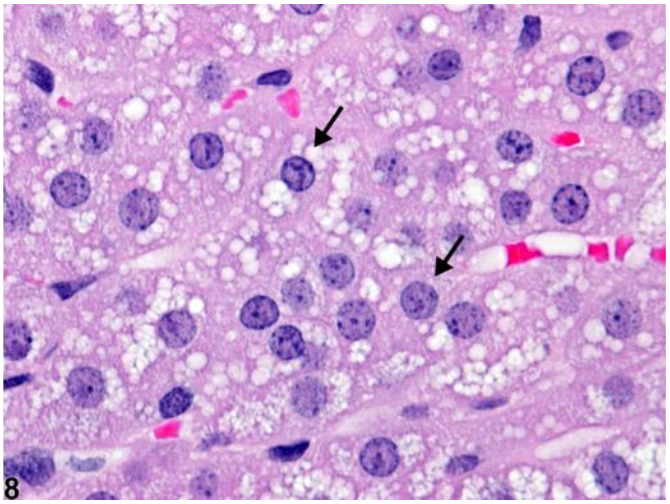

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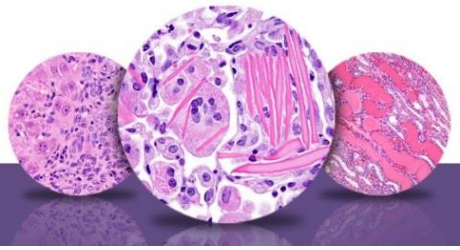
Figure Legend: **Figure 1** Adrenal gland, Cortex - Hypertrophy in a female Sprague-Dawley rat from a chronic study. There is a well-demarcated, noncompressive focal area in which the cells are enlarged (FH). C = cortex, M = medulla. **Figure 2** Adrenal gland, Cortex - Hypertrophy in a female Sprague-Dawley rat from a chronic study (higher magnification of Figure 1). The cells in this focus of hypertrophy (FH) have increased amounts of pale eosinophilic cytoplasm. **Figure 3** Adrenal gland, Cortex - Hypertrophy in a male B6C3F1/N/N mouse from a chronic study. There is a focus of enlarged cells (arrows) in the cortex that slightly compresses the adjacent parenchyma; there is also subcapsular hyperplasia (SCH). **Figure 4** Adrenal gland, Cortex - Hypertrophy in a male B6C3F1/N/N mouse from a chronic study (higher magnification of Figure 3). The cells in this focus of hypertrophy (FH) have increased amounts of pale eosinophilic cytoplasm and slightly enlarged nuclei. **Figure 5** Adrenal gland, Cortex - Hypertrophy in a male F344/N rat from a chronic study. Diffuse cortical hypertrophy results in pronounced overall gland enlargement. M = medulla. **Figure 6** Adrenal gland, Cortex - Hypertrophy in a male F344/N rat from a chronic study (higher magnification of Figure 5). The hypertrophic cortical cells (arrows) have increased cytoplasmic volume. **Figure 7** Adrenal gland, Cortex - Normal in a male F344/N rat from a chronic study. A normal adrenal gland at the same magnification as Figure 5 6 is shown for comparison. M = medulla. **Figure 8** Adrenal gland, Cortex - Normal in a male F344/N rat from a chronic study. A normal adrenal gland at the same magnification as Figure 6 is shown for comparison.



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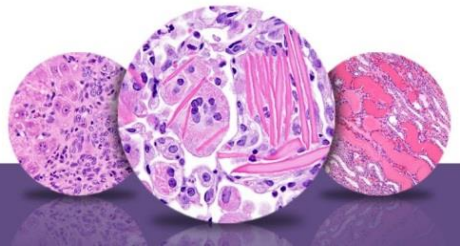
Comment: Adrenal cortical hypertrophy refers to an increased cell size without an appreciable increase in cell numbers. Hypertrophic cortical cells have increased amounts of cytoplasm, which may be pale to brightly eosinophilic (Figure 1, Figure 2, Figure 3, and Figure 4) but may also be clear, vacuolated, and/or basophilic. The nucleus is frequently enlarged. Small numbers of nuclei in a focus of hypertrophy may have features of atypia. If a large proportion of the hypertrophic cells are atypical, then atypia should be diagnosed rather than hypertrophy (see Adrenal gland, Cortex – Cellular atypia). Cortical hypertrophy may be focal or diffuse. Focal hypertrophy (Figure 1, Figure 2, Figure 3, and Figure 4) most often involves the zona fasciculata. Small hypertrophic foci are generally noncompressive, but larger focal lesions may cause variable compression of the adjacent cortical parenchyma (Figure 3).

Diffuse cortical hypertrophy (Figure 5 and Figure 6) often results in pronounced widening of the cortex and overall gland enlargement compared with unaffected normal adrenal glands (Figure 7 and Figure 8).

Cortical hypertrophy (of the zona fasciculata) in rats and mice usually results from elevated levels of adrenocorticotropic hormone (ACTH), which in turn can be elevated due to various causes, such as primary hypothalamic or pituitary disease or decreased glucocorticoid feedback regulation caused by adrenal cortical toxic or degenerative lesions. Diffuse, bilateral, and often prominent hypertrophy in the zona fasciculata can also be a sequela to stress from various causes, a finding that is especially common in rats.

Hypertrophy (and hyperplasia) of zona glomerulosa cells can result from derangements of the renin-angiotensin system that result in elevated angiotensin II.

Whether focal or diffuse, cortical hypertrophy is generally not considered to be a preneoplastic change. However, cortical hypertrophy (increased cell size) and hyperplasia (increased cell numbers) can often be concurrent lesions in the same gland or even in the same focus. Thus, as a practical matter, determining which change is predominant in a given lesion and/or gland can be very difficult. Cortical hypertrophy can also be confused with the cortical cell enlargement that occurs in many cases of cytoplasmic vacuolization.



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Recommendation: Adrenal cortical hypertrophy should be diagnosed and assigned a severity grade and appropriate distribution modifier (i.e., focal, diffuse). The modifier "bilateral" should be used when hypertrophy is present in both glands. An attempt should be made to distinguish cortical hypertrophy from hyperplasia, though the frequent superimposition of both changes in the same lesion can make this determination very challenging. In cases where both findings are concurrent in the same focus, only hyperplasia should be recorded, with the hypertrophy feature described in the pathology narrative. If there are a small number of atypical cells in the focus of hypertrophy, they should be described in the narrative. However, if the pathologist feels there is a large enough proportion of atypical cells, cellular atypia should be diagnosed (see Adrenal gland, Cortex - Cellular atypia).

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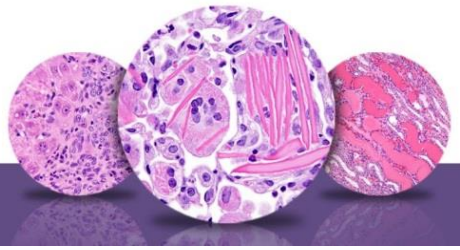

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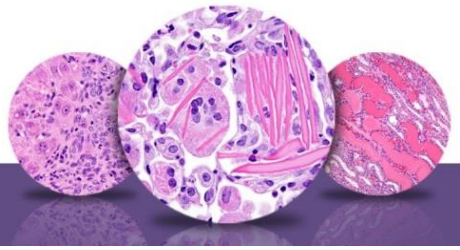

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