5.12: Corticosteroids

Corticosteroids can be prescribed in a variety of routes. Fluticasone is an example of a commonly used inhaled corticosteroid; prednisone is an example of a commonly used oral corticosteroid; and methylprednisolone is a commonly used IV corticosteroid. Additional information about corticosteroids and potential adrenal effects is located in the “Endocrine” chapter.

**Mechanism of Action**

Fluticasone is a locally acting anti-inflammatory and immune modifier. The nasal spray is used for allergies, and the oral inhaler is used for long-term control of asthma. Fluticasone is also used in a combination product with salmeterol. It decreases the frequency and severity of asthma attacks and improves overall asthma symptoms. See Figures 5.14-16[1][2][3] for images of different formulations of fluticasone.

Oral prednisone prevents the release of substances in the body that cause inflammation. It also suppresses the immune system.

Methylprednisolone IV prevents the release of substances in the body that cause inflammation. It also suppresses the immune system. Methylprednisolone requires reconstitution before administration. See Figure 5.17[4] for an image of methylprednisolone.

**Indications for Use**

Fluticasone inhalers are used to prevent asthma attacks. In respiratory conditions, oral prednisone is used to control severe or incapacitating allergic conditions that are unresponsive to adequate trials of conventional treatment for seasonal or perennial allergic rhinitis, bronchial asthma, contact dermatitis, atopic dermatitis, serum sickness, and drug hypersensitivity reactions. Methylprednisolone IV is used to rapidly control these same conditions.
**Nursing Considerations Across the Lifespan**

Fluticasone is safe for 4 years and older. Prednisone and methylprednisolone are safe for all ages.

**Adverse/Side Effects**

Fluticasone can cause hoarseness, dry mouth, cough, sore throat, and oropharyngeal candidiasis. Patients should rinse their mouths after use to prevent candidiasis (thrush).

Prednisone and methylprednisolone: See more information about adverse effects of corticosteroids in the “Endocrine” chapter. Cardiovascular symptoms can include fluid retention, edema, and hypertension. Imbalances such as hypernatremia (↑Na), hypokalemia (↓ K+), and increased blood glucose with associated weight gain can occur. CNS symptoms include mood swings and euphoria. GI symptoms can include nausea, vomiting, and GI bleed. In long-term therapy, bone resorption occurs, which increases the risk for fractures; the skin may bruise easily and become paper thin; wound healing is delayed; infections can be masked; and the risk for infection increases. Long-term corticosteroid therapy should never be stopped abruptly because adrenal insufficiency may occur.\[5\]

**Photo of Fluticasone nasal spray and package**

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**Figure 5.14 Fluticasone nasal spray formulation**
Figure 5.15 Fluticasone oral inhaler formulation

Photo of hand holding a AdVair brand powder inhaler

Figure 5.16 Fluticasone combination formulation
### Patient Teaching & Education

Patients should be advised that corticosteroids are not used to treat an acute asthma attack. They can cause immunosuppression and suppress signs of infection. Corticosteroids can also cause an increase in blood glucose levels. Patients may experience weight gain, swelling, increased fatigue, bruising, and behavioral changes. These occurrences should be reported to one’s healthcare provider.\(^6\)

Now let’s take a closer look at the medication grid for fluticasone, prednisone, and methylprednisolone in Table 5.12.\(^7\)\(^8\)\(^9\)

#### Table 5:12 Fluticasone, Prednisone, and Methylprednisolone Medication Grid

<table>
<thead>
<tr>
<th>Class/Subclass</th>
<th>Prototype/Generic</th>
<th>Administration Considerations</th>
<th>Therapeutic Effects</th>
<th>Adverse/Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corticosteroids</td>
<td>fluticasone</td>
<td>Rinse mouth after use</td>
<td>Nasal spray: Used for management of the nasal symptoms of perennial nonallergic rhinitis</td>
<td>Hoarseness, dry mouth, cough, sore throat, and oropharyngeal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do not use as a “rescue”</td>
<td>Inhaler: Used to improve the control</td>
<td></td>
</tr>
<tr>
<td>Medication</td>
<td>Effect</td>
<td>Side Effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>--------</td>
<td>--------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication of asthma by reducing inflammation in the airways</td>
<td></td>
<td>Candidiasis</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CV: fluid retention, edema, and hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Electrolytes: ↑Na, ↓K+, ↑Ca, ↑BG</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CNS: mood swings and euphoria in high doses</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GI: Nausea/Vomiting, GI bleed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS: bone resorption</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin: acne, paper thin, bruises, infections, and delayed healing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weight gain</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adrenal suppression</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increased risk for infection and infections can be masked</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long-term use may result in Cushing's syndrome</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Corticosteroids**

- **Prednisone**

- **Do not use if signs of a systemic infection**

- **When using more than 10 days, the dose must be slowly tapered**

- **May increase blood glucose levels**

- **Used to control severe or incapacitating allergic or respiratory conditions**

- **CV:** fluid retention, edema, and hypertension

- **Electrolytes:** ↑Na, ↓K+, ↑Ca, ↑BG

- **CNS:** mood swings and euphoria in high doses

- **GI:** Nausea/Vomiting, GI bleed

- **MS:** bone resorption

- **Skin:** acne, paper thin, bruises, infections, and delayed healing

- **Weight gain**

- **Adrenal suppression**

- **Increased risk for infection and infections can be masked**

- **Long-term use may result in Cushing's syndrome**
| **Corticosteroids** | methylprednisolone | May increase blood glucose levels | Used to rapidly control severe or incapacitating allergic or respiratory conditions, in sepsis to reduce systemic inflammation, and to treat adrenal insufficiency | Same as prednisone |

1. "Fluticasone Propionate Nasal Spray" by _BuBBy_ is licensed under [CC BY 2.0](https://creativecommons.org/licenses/by/2.0/).
2. "Fluticasone.JPG" by James Heilman, MD is licensed under [CC BY-SA 4.0](https://creativecommons.org/licenses/by-sa/4.0/).
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