

Chronic rhinitis

Recurrent nasal inflammation, mucosal injury, and impaired secretion drainage

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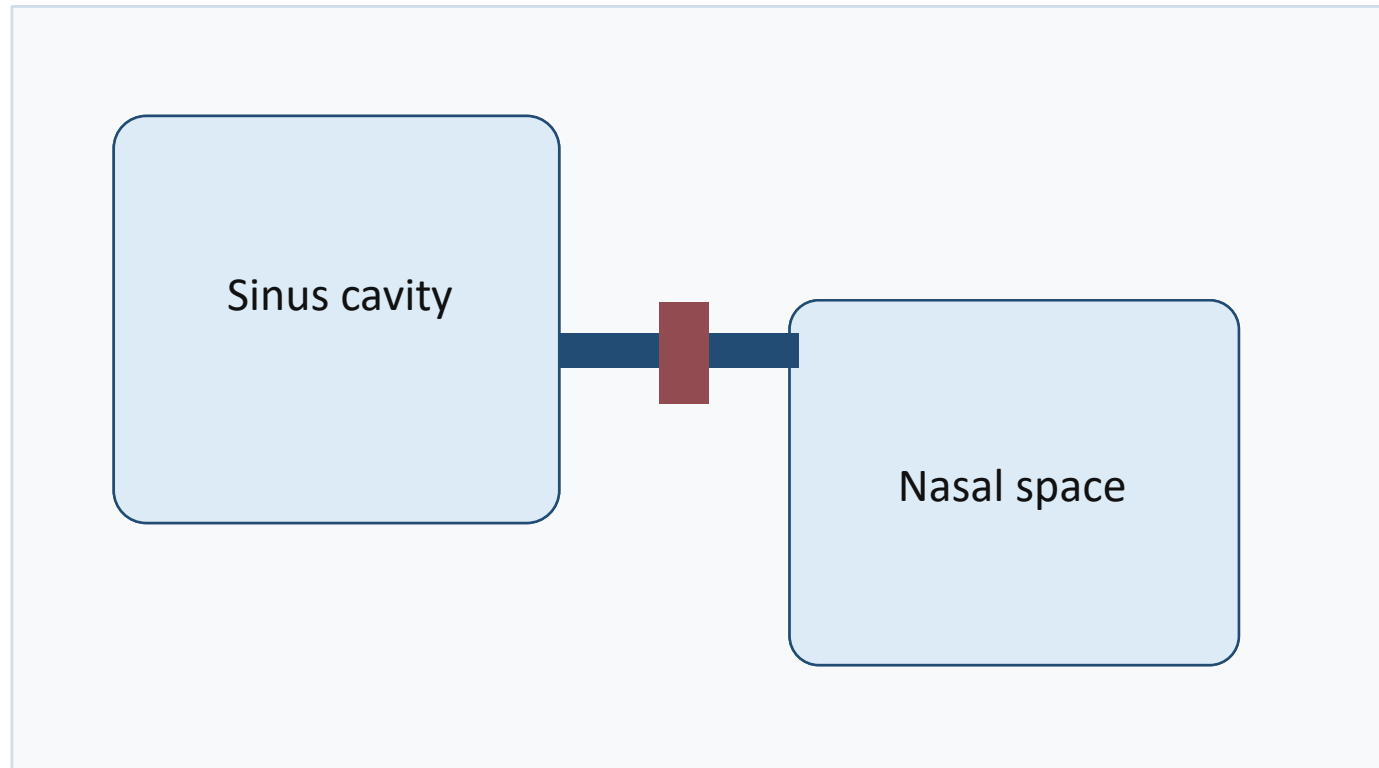
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Learning objectives

- Trace repeated microbial or allergic attacks to chronic rhinitis and bacterial superinfection.
- Identify epithelial injury and the three inflammatory cell types described in the source.
- Connect nasal obstruction with polyps, impaired drainage, and sinusitis.

The upper-airway framework



Schematic — not a clinical or histologic specimen

- The upper airway includes the nose, pharynx, and larynx.
- Nasal inflammation is an important group of upper-airway disorders.
- The nose and accessory sinuses share interconnected drainage pathways.

Infectious, allergic, and chronic processes

Microbial rhinitis

Allergic rhinitis

Repeated mucosal inflammation

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graph TD; A[Microbial rhinitis] --> C[Repeated mucosal inflammation]; B[Allergic rhinitis] --> C;
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The diagram illustrates the relationship between different types of rhinitis and mucosal inflammation. At the top, a light blue box contains the title 'Infectious, allergic, and chronic processes'. Below this, two light blue boxes are positioned side-by-side: 'Microbial rhinitis' on the left and 'Allergic rhinitis' on the right. Arrows from both of these boxes point downwards to a single, darker blue box at the bottom labeled 'Repeated mucosal inflammation'.

Chronic rhinitis: The defining sequence

- Repeated microbial or allergic rhinitis provides the antecedent history.
- Superimposed bacterial infection can complicate the recurrent process.
- The mucosa develops surface injury and an inflammatory-cell infiltrate.

A recurrent process differs from one cold

Acute episode

Acute infectious rhinitis often clears rapidly.

Chronic process

Chronic rhinitis follows repeated episodes of inflammation.

Time course and preceding episodes alter clinicopathologic interpretation.

Distinct starting mechanisms

Allergic

Allergen exposure initiates an IgE-mediated mucosal reaction.

Microbial

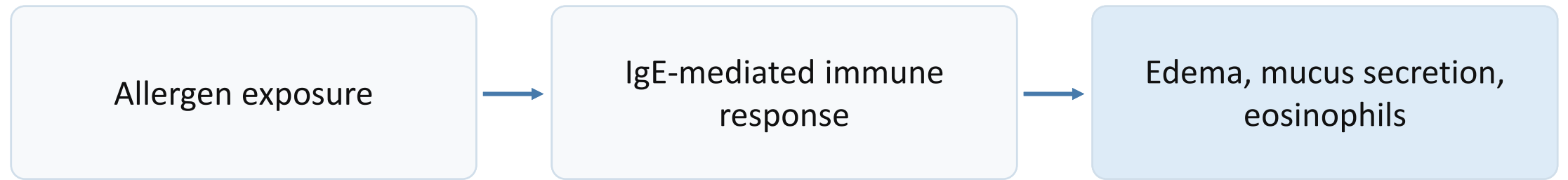
Viral respiratory infection initiates microbial rhinitis.

Both pathways can recur and precede chronic inflammation.

Allergic rhinitis: Common triggers

- Relevant allergens include plant pollens, fungi, animal allergens, and dust mites.
- The inflammatory process is an IgE-mediated hypersensitivity reaction.
- Early and late phases occur in the accompanying immune response.

Allergic mucosal response



Infectious rhinitis: Acute mucosal effects

- Rhinoviruses, echoviruses, and adenoviruses are described as viral causes.
- Acute mucosal edema and thickening narrow the nasal cavity.
- Secondary bacterial infection can produce mucopurulent or suppurative exudate.

Two initiating pathways can converge

Repeated microbial rhinitis

Repeated allergic rhinitis

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graph TD; A[Repeated microbial rhinitis] --> D[Inflamed nasal mucosa]; B[Repeated allergic rhinitis] --> D;
```

Inflamed nasal mucosa

Superimposed bacterial infection

- Bacterial superinfection is explicitly described in the course of chronic rhinitis.
- This process adds infection to an already repeatedly inflamed mucosa.
- An allergic episode alone must not be equated with bacterial infection.

Core pathogenic sequence

Recurrent episodes

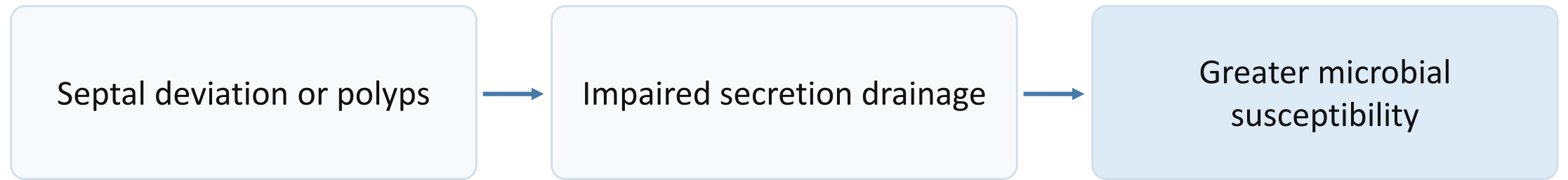


Bacterial superinfection

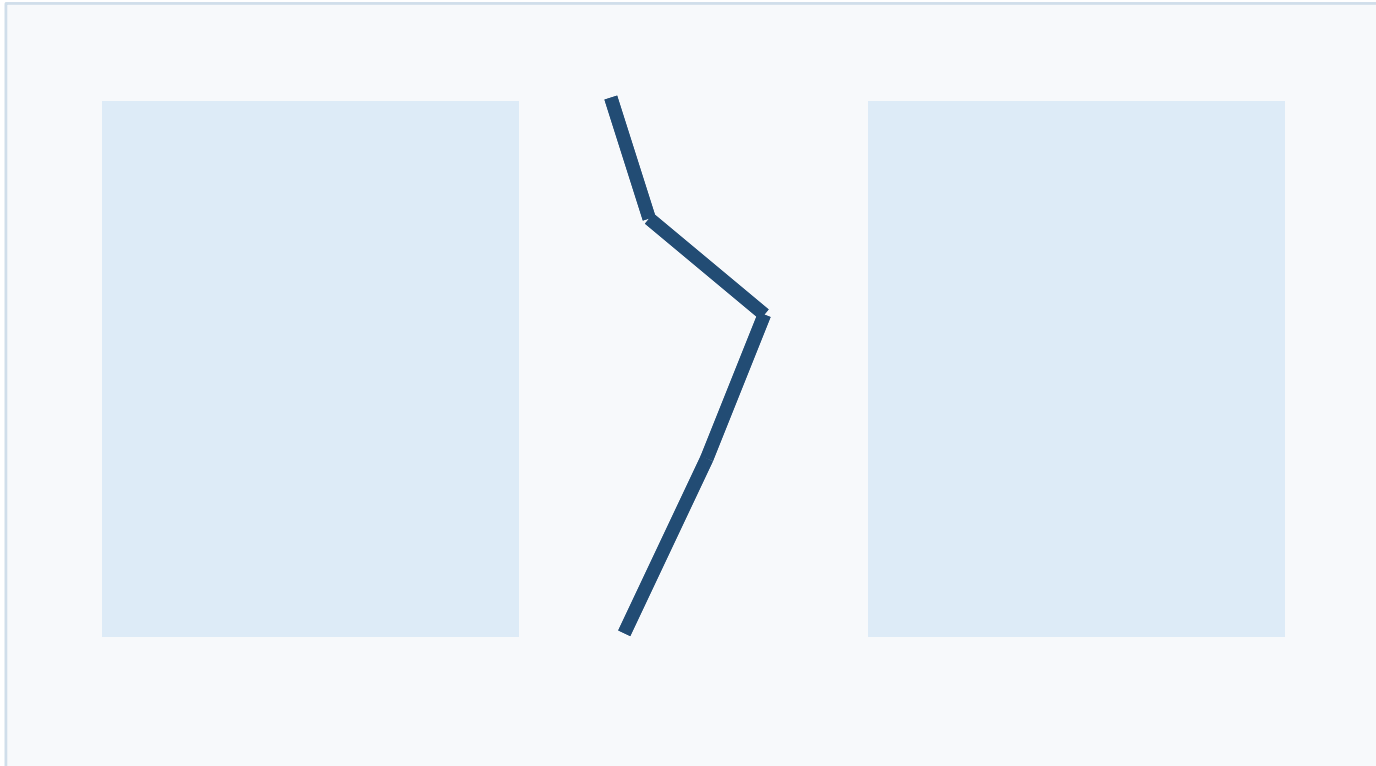


Mucosal inflammatory injury

Drainage modifies disease progression



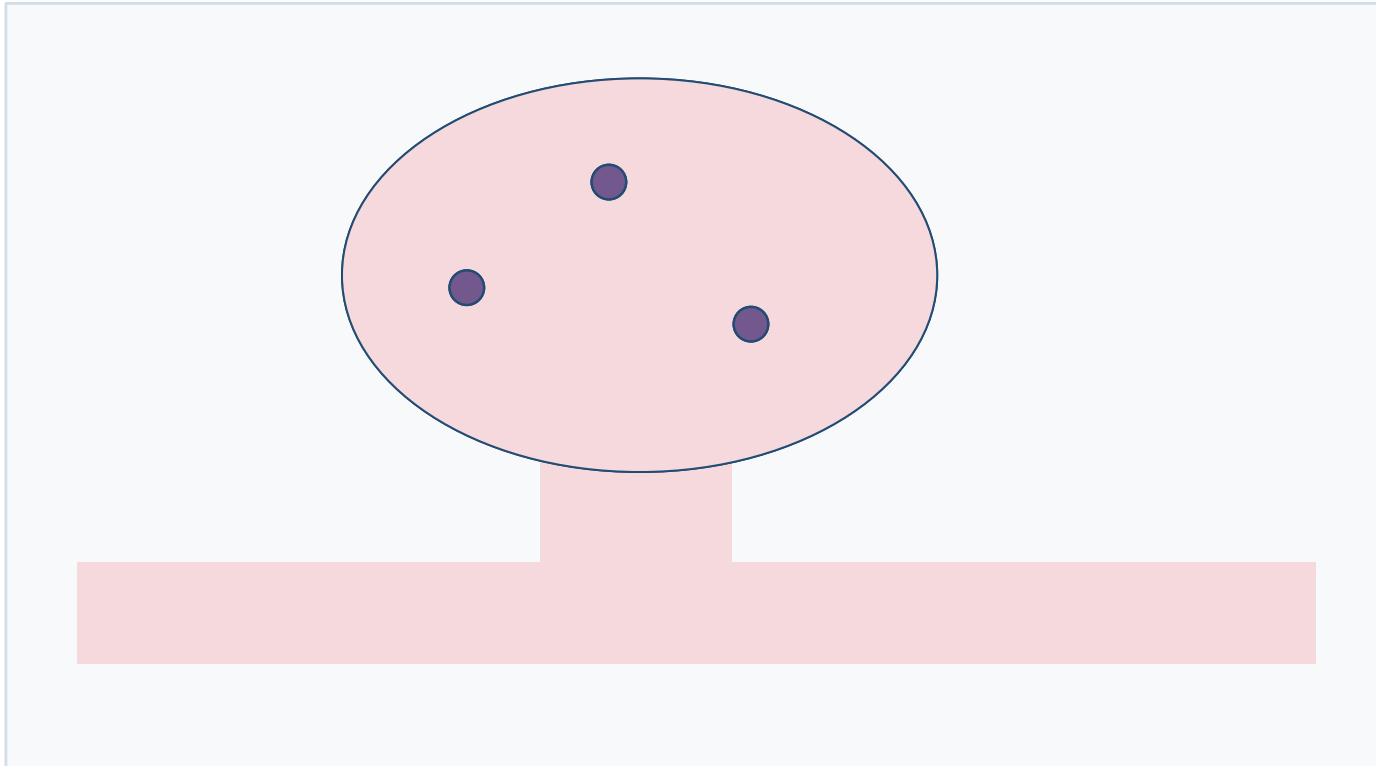
Septal deviation is a structural risk



Schematic — not a clinical or histologic specimen

- An altered septal contour can impede normal secretion drainage.
- The key effect is impaired passage of nasal secretions.
- Poor clearance predisposes the mucosa to microbial invasion.

Nasal polyps provide a second obstruction



Schematic — not a clinical or histologic specimen

- Recurrent rhinitis may produce focal mucosal protrusions.
- When large or multiple, polyps may encroach on the airway.
- Polyp-associated obstruction can impede sinus drainage.

Obstructions share a functional consequence

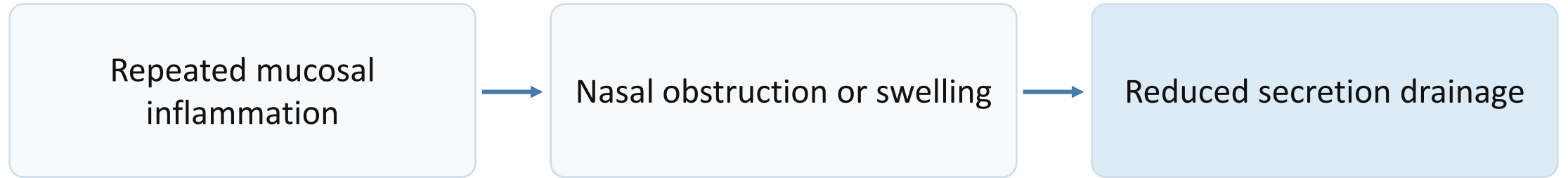
Deviated nasal septum

Mucosal polyps

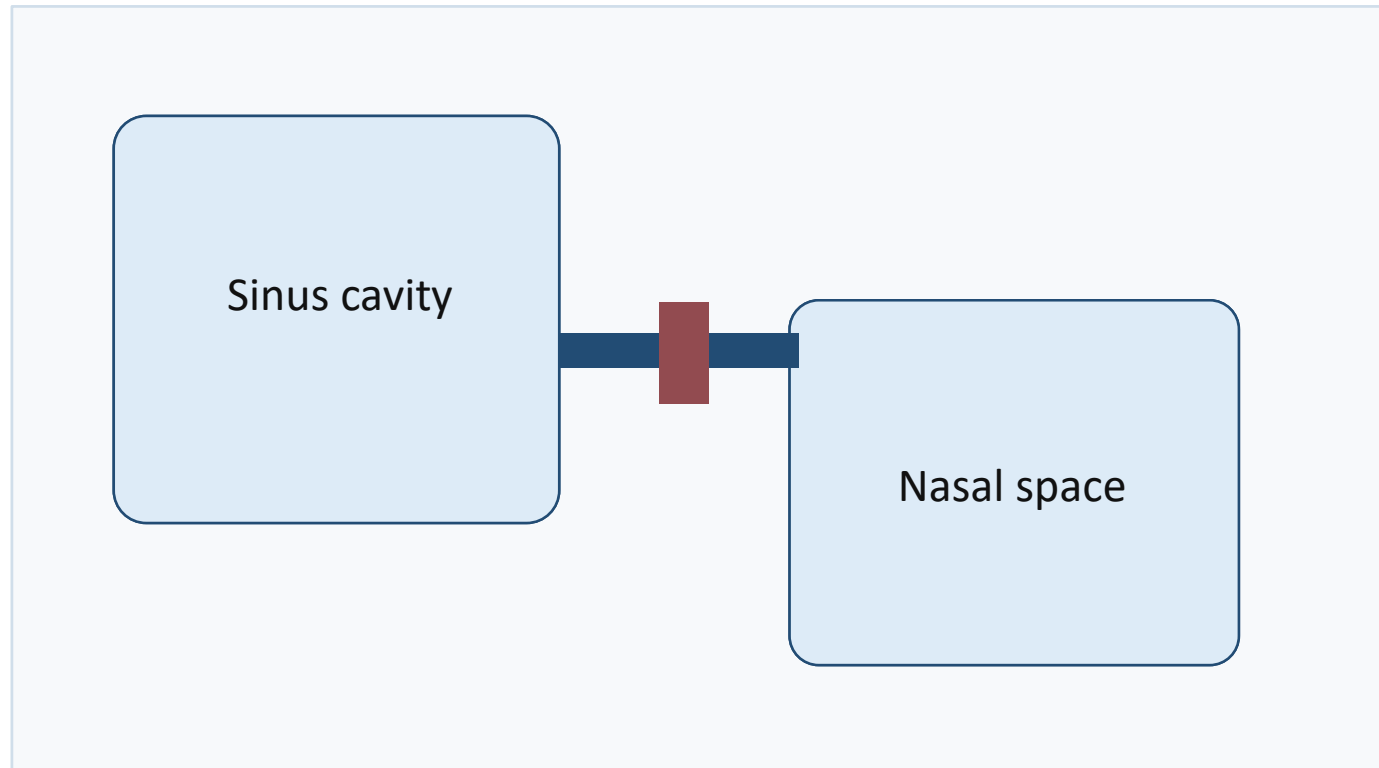
Impaired drainage of secretions

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graph TD; A[Deviated nasal septum] --> C[Impaired drainage of secretions]; B[Mucosal polyps] --> C;
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The inflammation–obstruction relationship



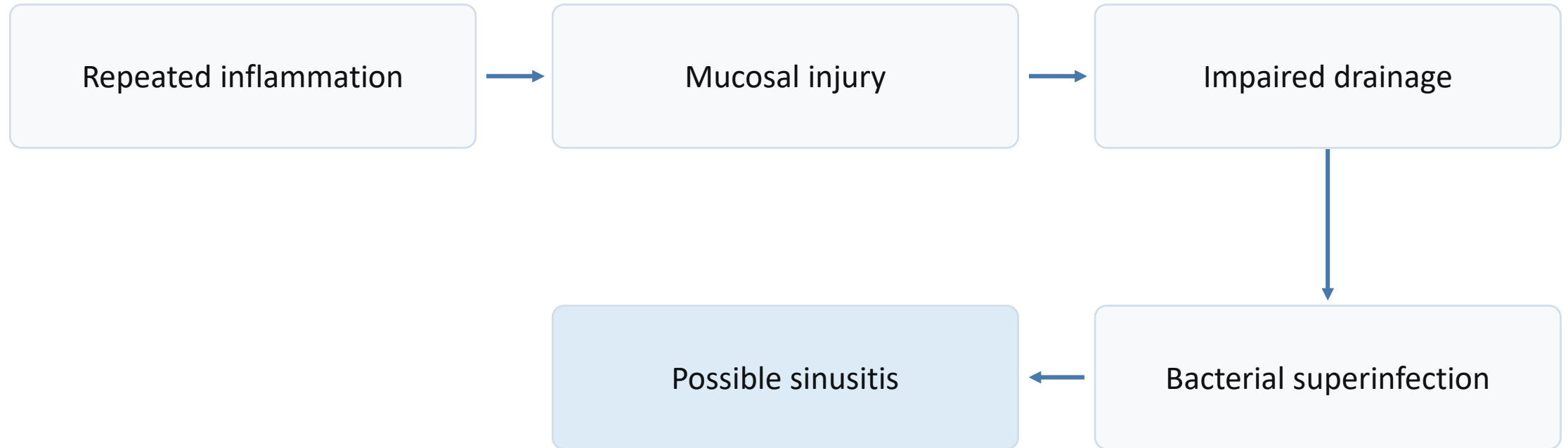
Extension beyond the nasal cavity



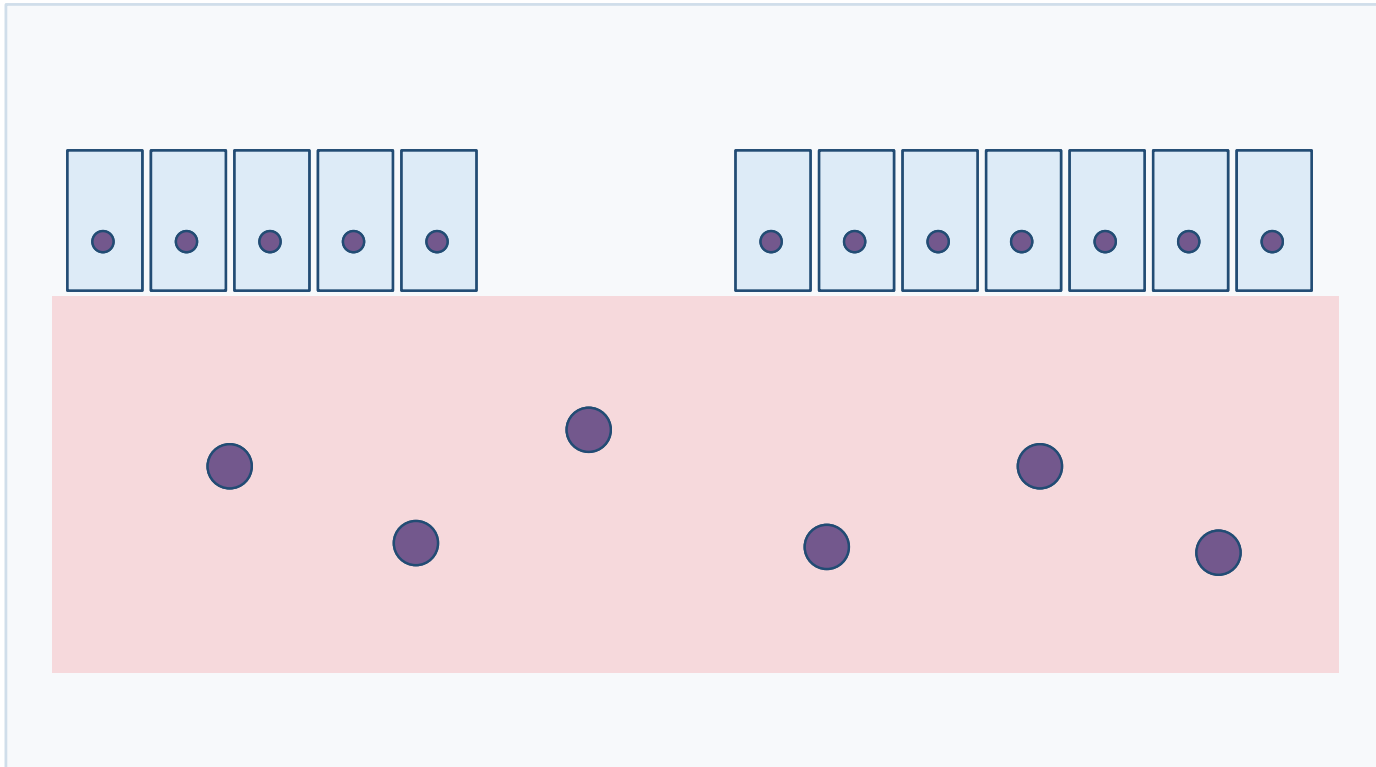
Schematic — not a clinical or histologic specimen

- Infection associated with chronic rhinitis may spread into sinuses.
- Nasal and sinus spaces communicate through drainage routes.
- Rhinitis and sinusitis therefore can form a connected disease process.

Integrated pathogenesis



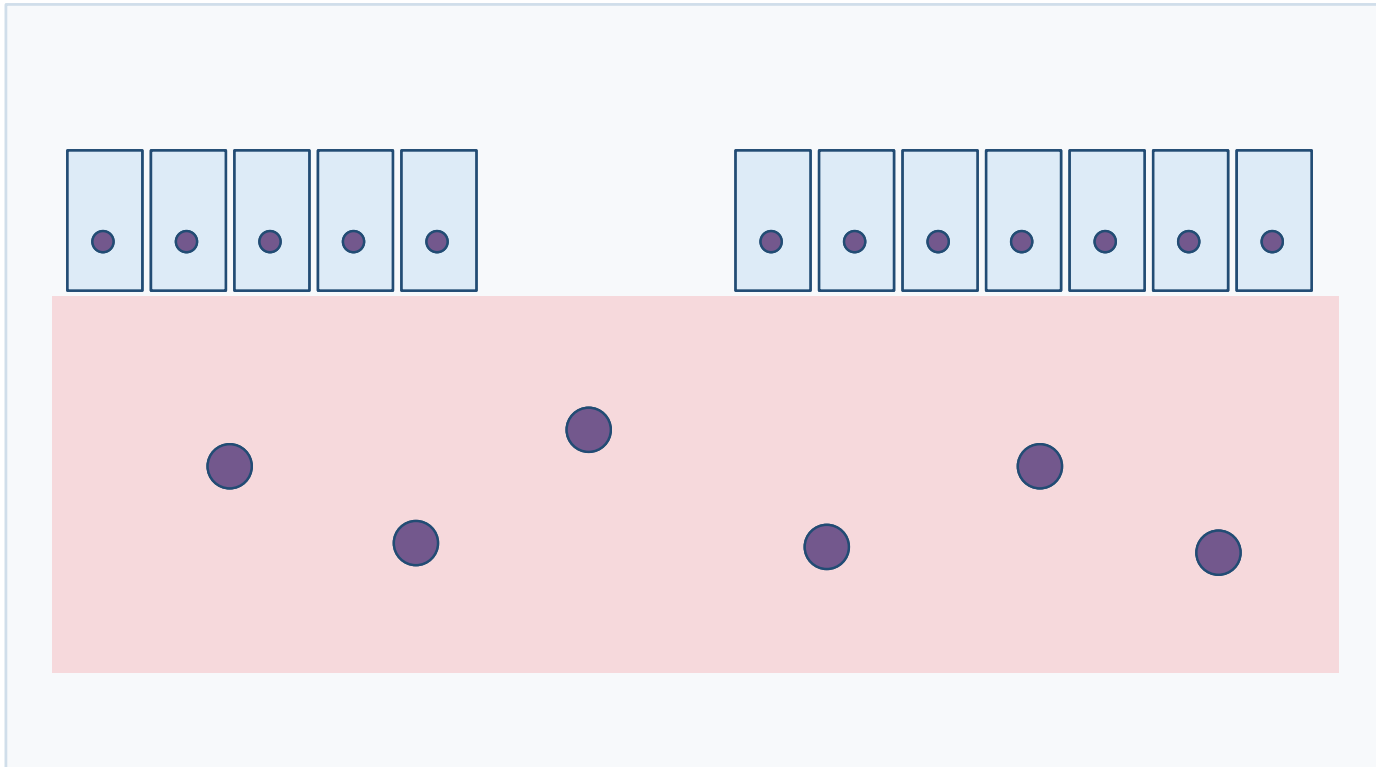
Histology has two complementary compartments



Schematic — not a clinical or histologic specimen

- Inspect the mucosal surface for epithelial integrity or loss.
- Inspect the underlying tissue for inflammatory-cell infiltrates.
- The stated inflammatory response includes neutrophils, lymphocytes and plasma cells.

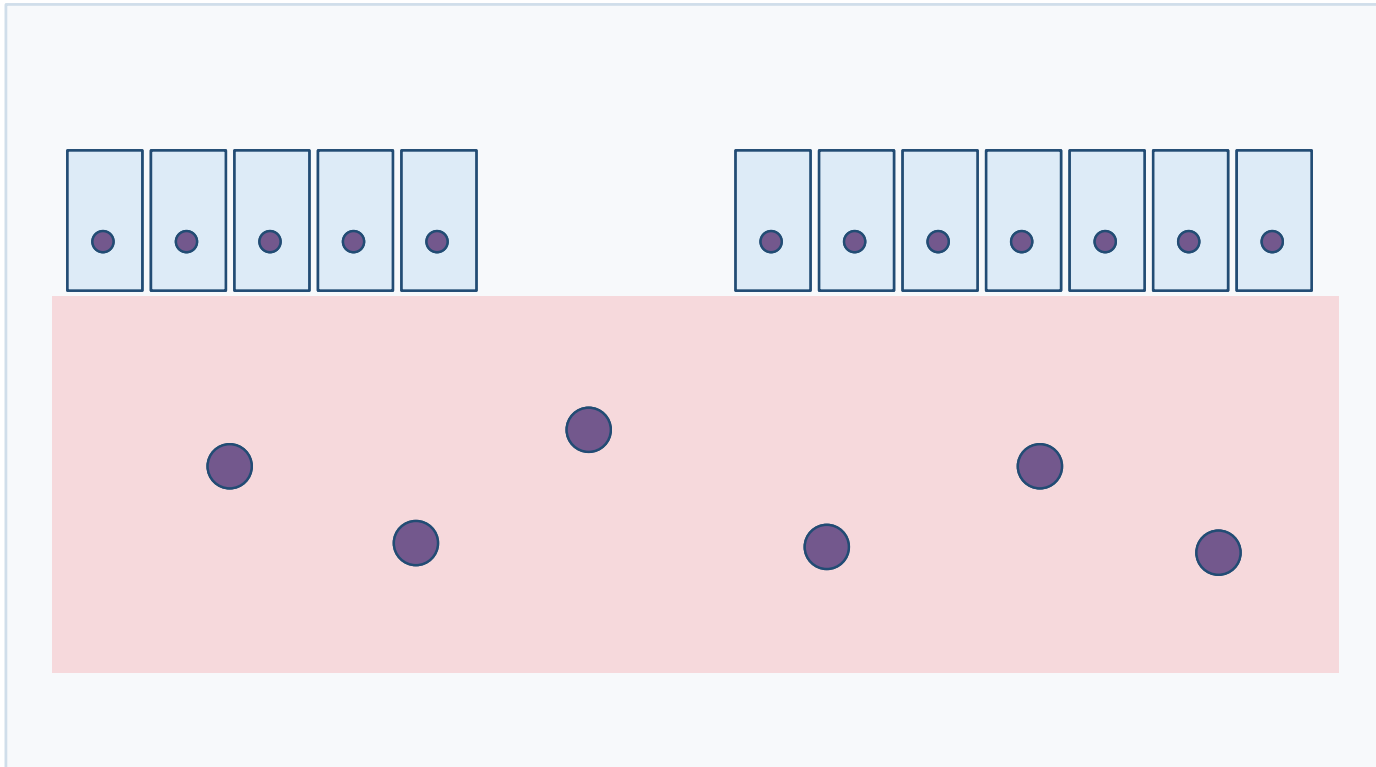
Superficial epithelial desquamation



Schematic — not a clinical or histologic specimen

- Desquamation refers to shedding or loss of the lining epithelial cells.
- Superficial mucosal injury is a common change in chronic rhinitis.
- Evaluate epithelial changes separately from inflammatory-cell composition.

Superficial mucosal ulceration



Schematic — not a clinical or histologic specimen

- Ulceration produces a defect in the mucosal surface.
- The source permits superficial mucosal ulceration in chronic rhinitis.
- Surface ulceration is not equivalent to an intact reactive epithelium.

Intact and injured mucosal surfaces

Intact surface

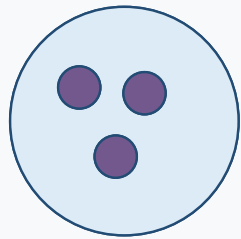
The intact surface maintains a continuous epithelial lining.

Injured surface

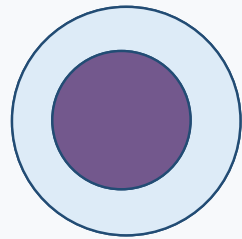
An injured surface may demonstrate desquamation or ulceration.

The adjacent inflammatory infiltrate helps characterize the process.

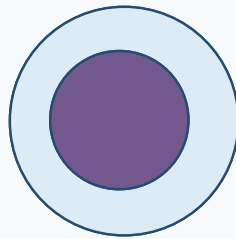
Chronic rhinitis contains a mixed infiltrate



Neutrophil



Lymphocyte

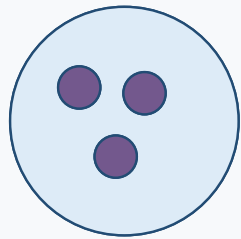


Plasma cell

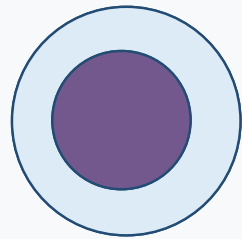
- Variable neutrophils may be present.
- Lymphocytes are also described in the inflammatory infiltrate.
- Plasma cells complete the listed chronic-rhinitis cell spectrum.

Schematic — not a clinical or histologic specimen

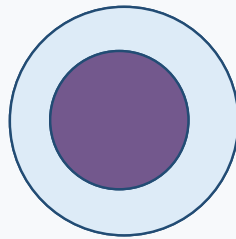
Neutrophils in chronic rhinitis



Neutrophil



Lymphocyte

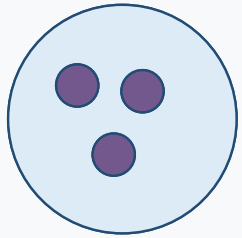


Plasma cell

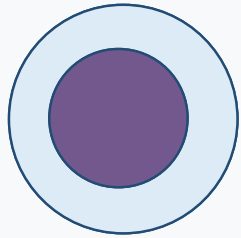
- Neutrophils are one component of the mixed inflammatory response.
- Their proportion may vary across lesions.
- Neutrophils alone do not establish a single specific cause.

Schematic — not a clinical or histologic specimen

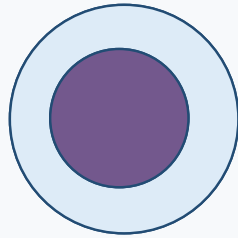
Lymphocytes in chronic rhinitis



Neutrophil



Lymphocyte

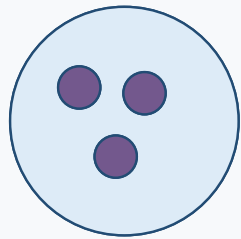


Plasma cell

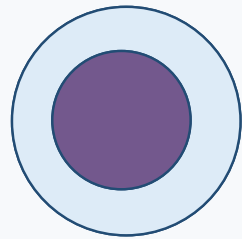
- Lymphocytes can infiltrate the mucosa in chronic rhinitis.
- They coexist with other cell types in the source description.
- Interpret them alongside epithelial injury and clinical context.

Schematic — not a clinical or histologic specimen

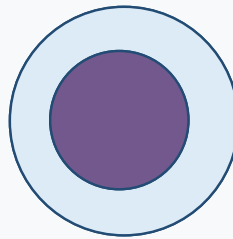
Plasma cells in chronic rhinitis



Neutrophil



Lymphocyte



Plasma cell

- Plasma cells are named in the source inflammatory-cell spectrum.
- Relative abundance varies within this mixed infiltrate.
- No numerical plasma-cell threshold is supplied for this entity.

Schematic — not a clinical or histologic specimen

The inflammatory mixture is variable

Neutrophils

A lesion may show a conspicuous neutrophil component.

Mononuclear cells

Another lesion may contain more lymphocytes and plasma cells.

There is no mandatory fixed ratio among these three populations.

Allergic and chronic patterns are distinct

Allergic rhinitis

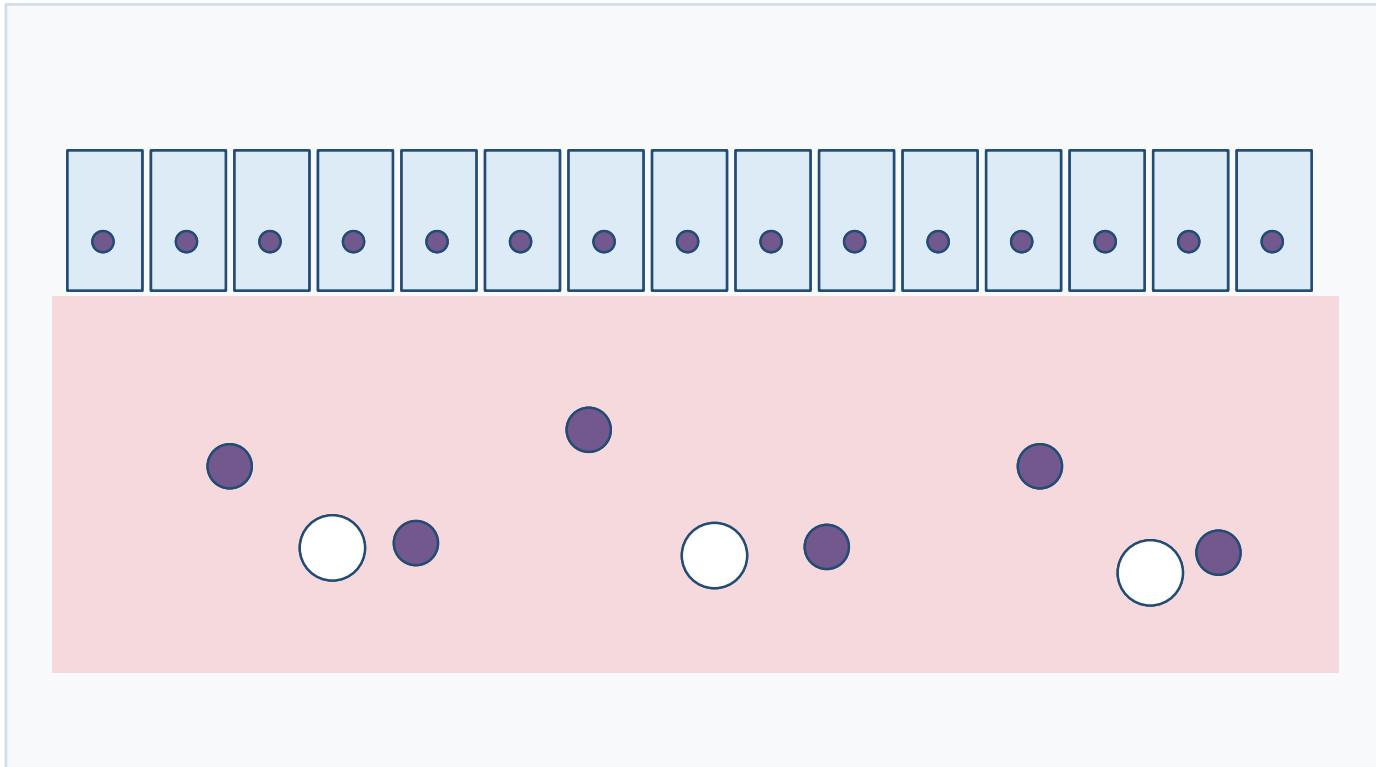
Allergic rhinitis has an eosinophil-rich infiltrate in the neighboring text.

Chronic rhinitis

Chronic rhinitis includes variable neutrophils, lymphocytes, and plasma cells.

Do not require eosinophilia in every chronic-rhinitis specimen.

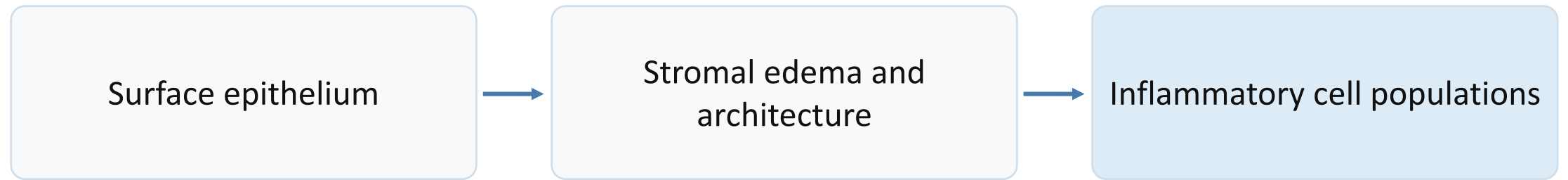
Edema contributes to tissue and airway change



Schematic — not a clinical or histologic specimen

- Allergic mucosal reactions can produce edema and mucus secretion.
- Nasal-polyps stroma may be markedly edematous.
- Swelling and protrusions can reduce available airway and drainage space.

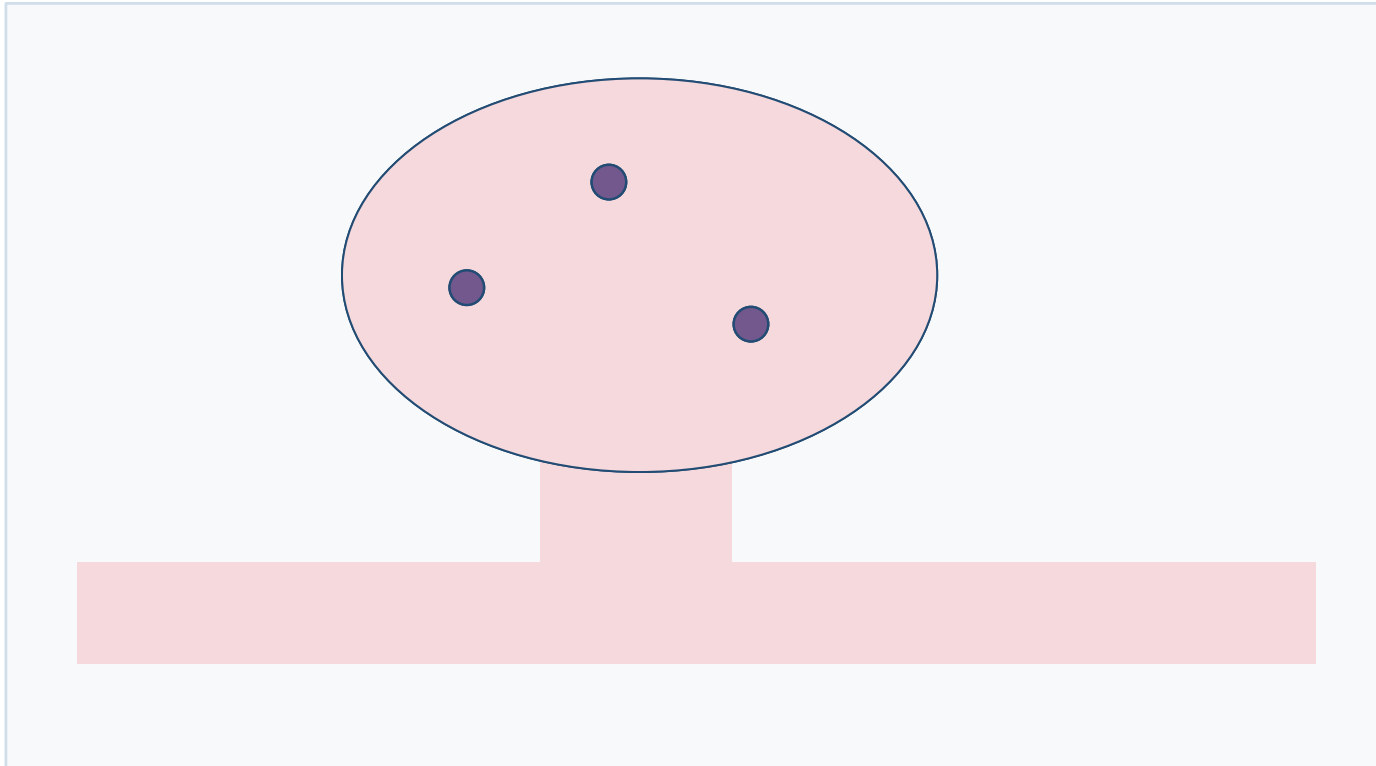
A structured mucosal review



Morphology synthesis: Chronic rhinitis

- Superficial epithelial desquamation or ulceration is typical.
- Neutrophils, lymphocytes, and plasma cells occur in variable proportions.
- Interpret these findings in recurrent inflammation with possible superinfection.

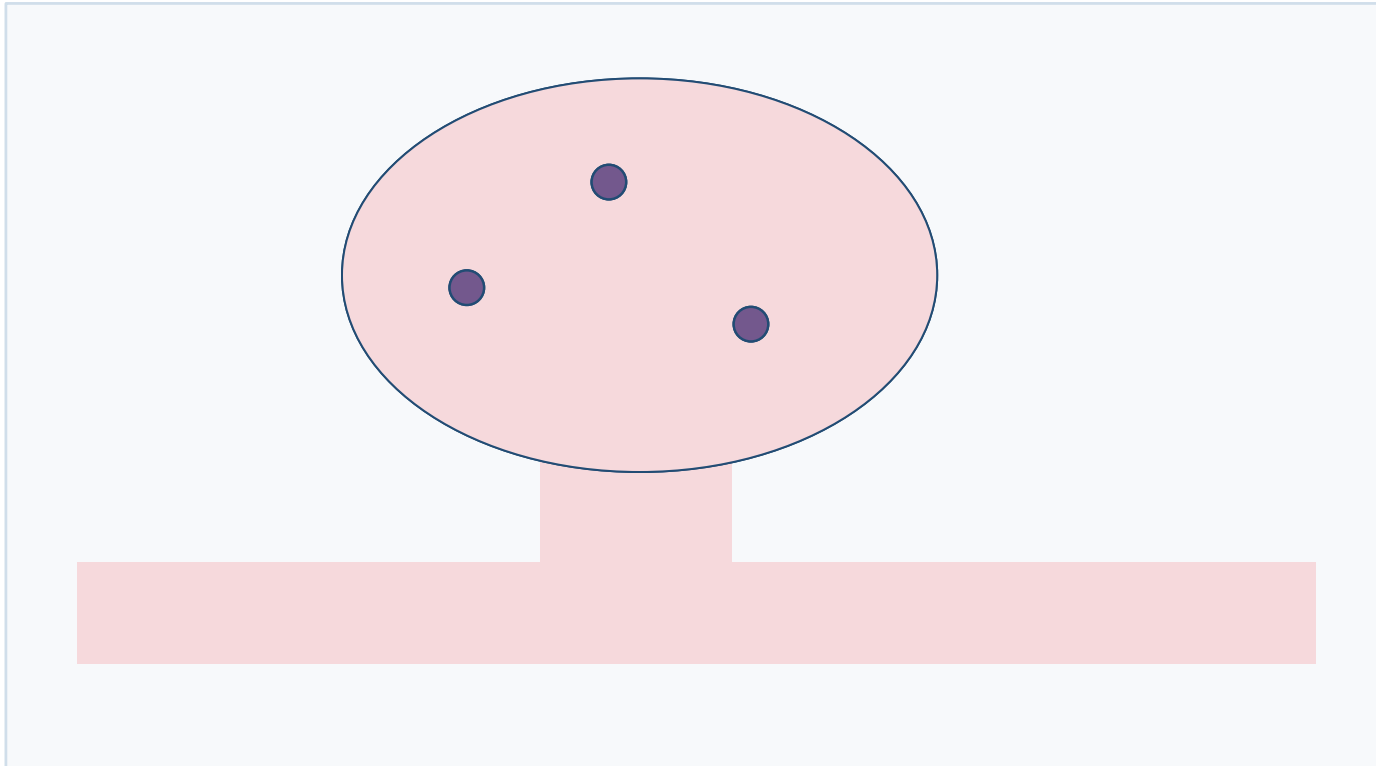
How polyps arise from recurrent rhinitis



Schematic — not a clinical or histologic specimen

- Repeated rhinitis can produce focal protrusions of mucosal tissue.
- A polyp is a localized expansion rather than diffuse flat mucosal swelling.
- Its significance increases when it impairs the airway or drainage.

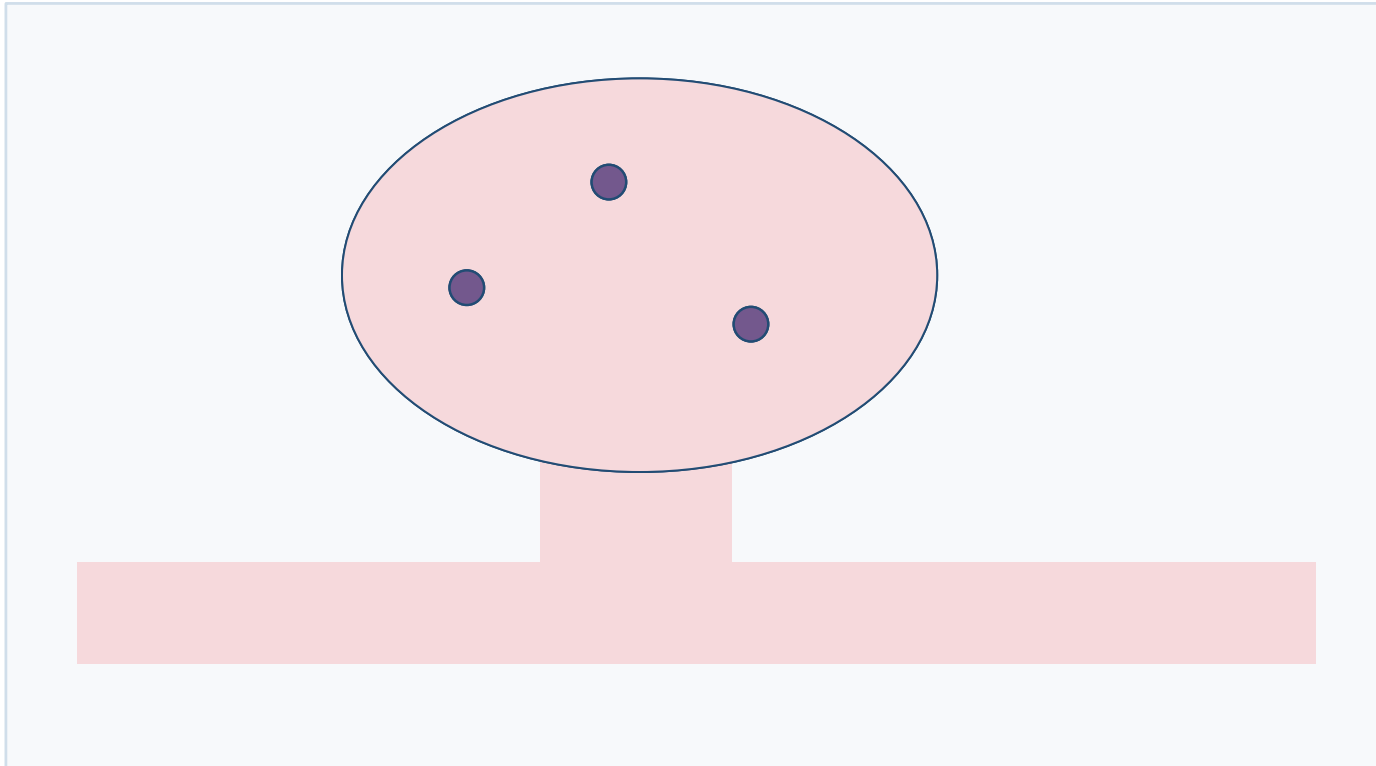
Polyp size and encroachment



Schematic — not a clinical or histologic specimen

- Nasal polyps may attain lengths of 3–4 cm.
- Large or multiple lesions can encroach on the airway.
- Sinus drainage can be disrupted by extensive polyposis.

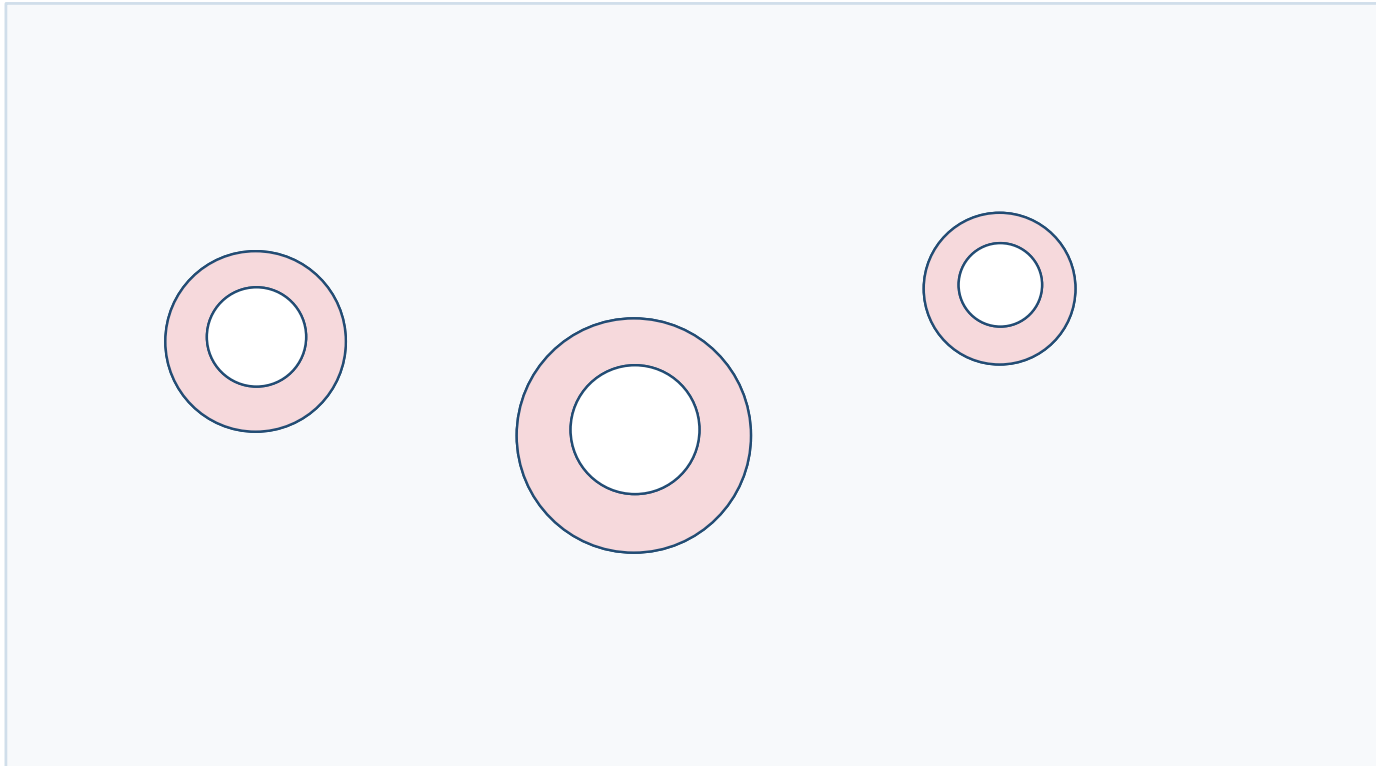
The polyp contains loose edematous stroma



Schematic — not a clinical or histologic specimen

- The polyp core is edematous mucosa with loose stromal architecture.
- The expanded stroma forms the substance of the mucosal protrusion.
- This is inflammatory polyp architecture, not tumor staging.

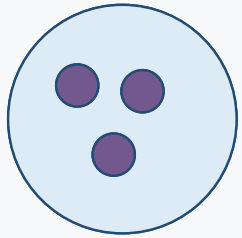
Glandular changes within nasal polyps



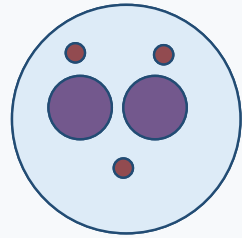
Schematic — not a clinical or histologic specimen

- Hyperplastic mucus glands can be identified.
- Cystic gland changes are another described finding.
- These glands coexist with stromal edema and inflammation.

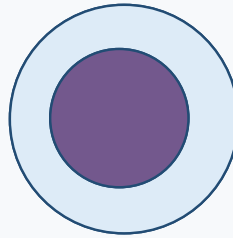
Polyps have their own cell spectrum



Neutrophil



Eosinophil



Plasma cell

- Polyp infiltrates can contain neutrophils.
- Eosinophils are often important in the described inflammatory mixture.
- Plasma cells are also listed in the adjacent pathology description.

Schematic — not a clinical or histologic specimen

Polyp surface: Intact versus ulcerated

Intact surface

Without bacterial infection the polyp surface may remain intact.

Ulcerated surface

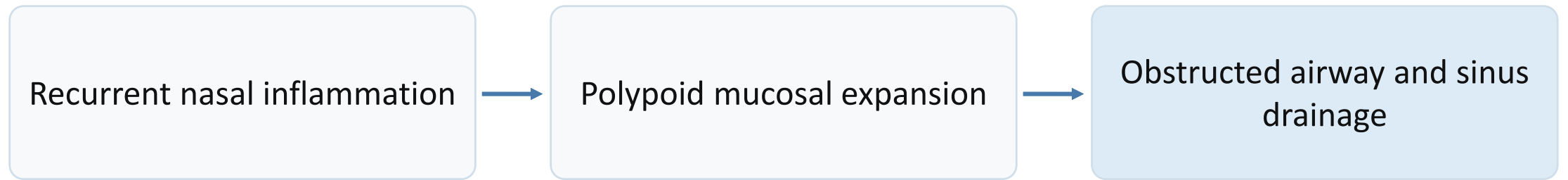
With infection the mucosal surface may become ulcerated.

Surface integrity helps interpret superimposed inflammation.

A polyp does not always signify atopy

- Most people with nasal polyps are not atopic.
- An eosinophil-rich polyp does not independently establish systemic atopy.
- Interpret morphology together with clinical inflammatory context.

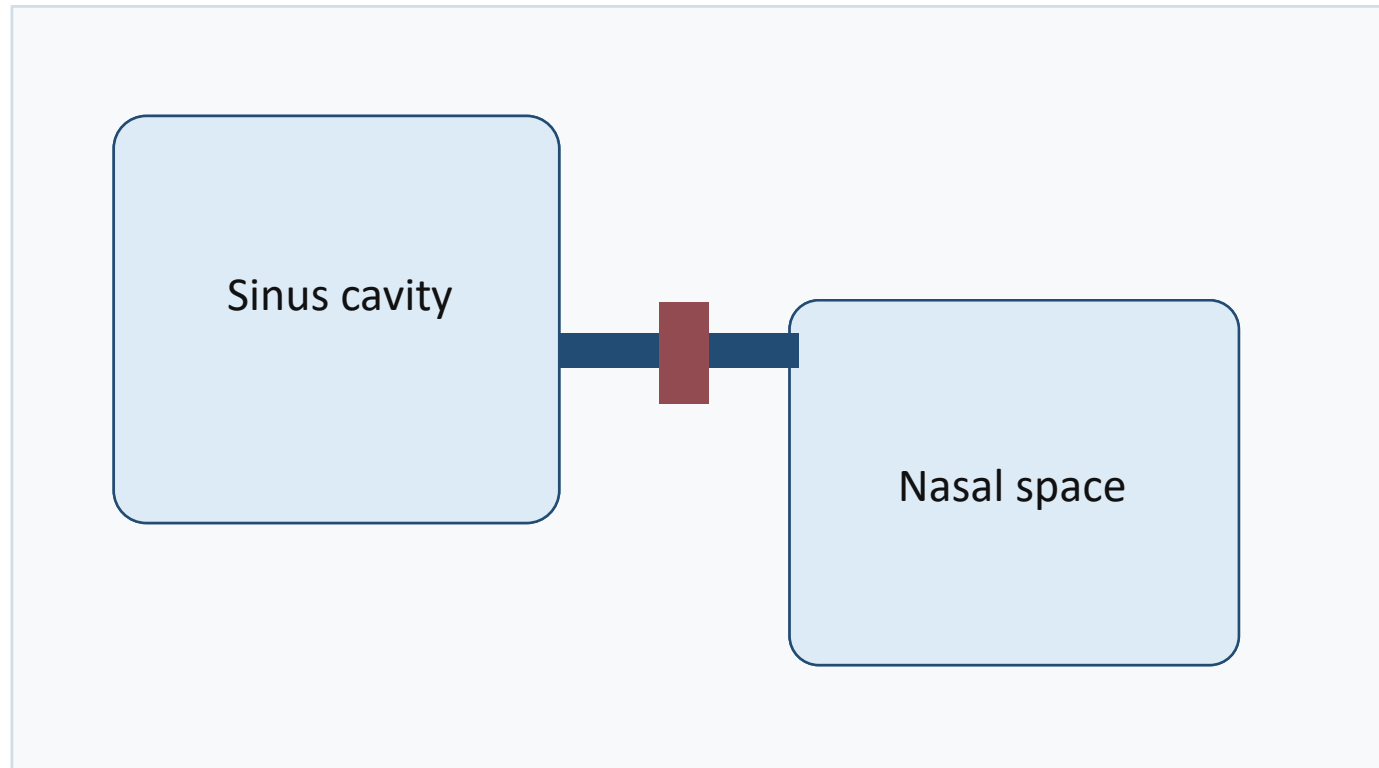
Polyps link chronic inflammation to obstruction



Compare three related nasal entities

Process	Characteristic morphology	Functional effect
Infectious rhinitis	Acute swollen mucosa, catarrh	Possible bacterial exudate
Chronic rhinitis	Epithelial injury, mixed infiltrate	Repeated inflammation and superinfection
Inflammatory polyp	Edematous protruding mucosa, glands	Potential airway and outflow obstruction

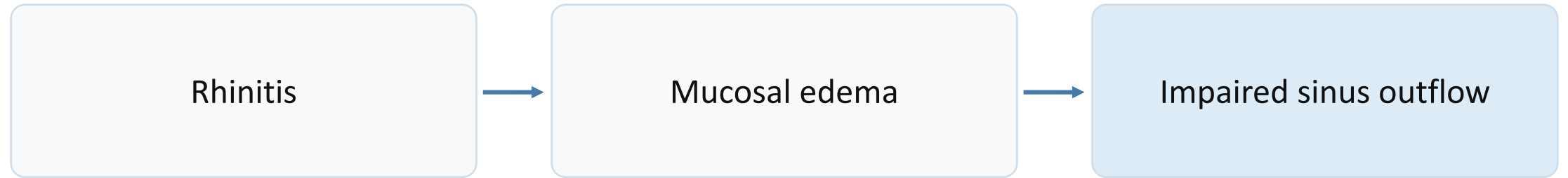
The nasal–sinus relationship



- Chronic nasal infection can extend into the sinuses.
- Rhinitis often precedes acute sinusitis.
- Edema and obstruction connect nasal and sinus inflammation.

Schematic — not a clinical or histologic specimen

Rhinitis commonly precedes sinusitis



An alternative origin: Dental infection

Rhinitis route

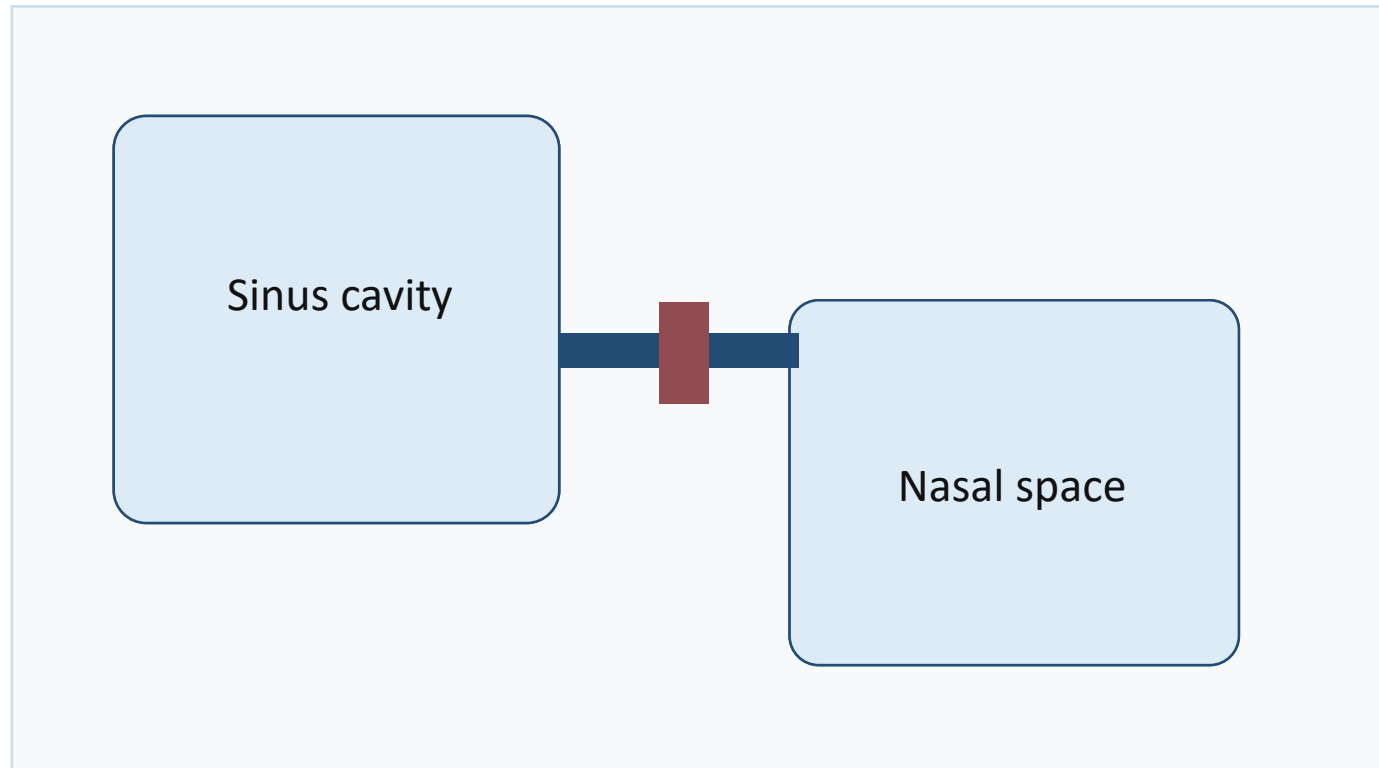
Most acute sinusitis cases are preceded by rhinitis.

Odontogenic route

A periapical infection may extend through the maxillary sinus floor.

These represent different anatomic routes into sinus inflammation.

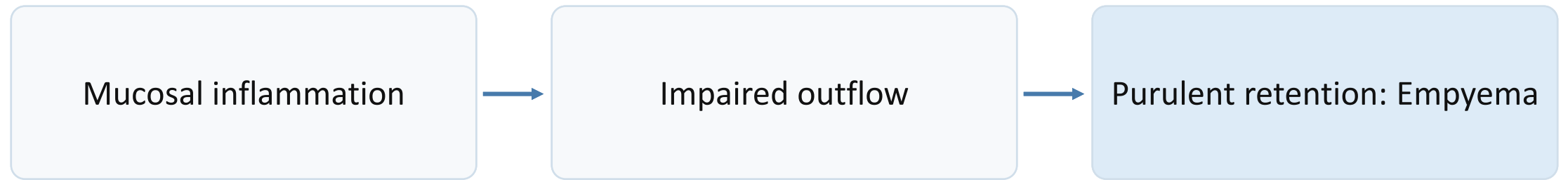
Outflow obstruction retains sinus contents



- An inflamed sinus develops edematous mucosa.
- Edema obstructs drainage from the cavity.
- Trapped secretions can accumulate behind the narrowing.

Schematic — not a clinical or histologic specimen

Empyema develops in an infected sinus



Mucocele and empyema are distinct

Mucocele

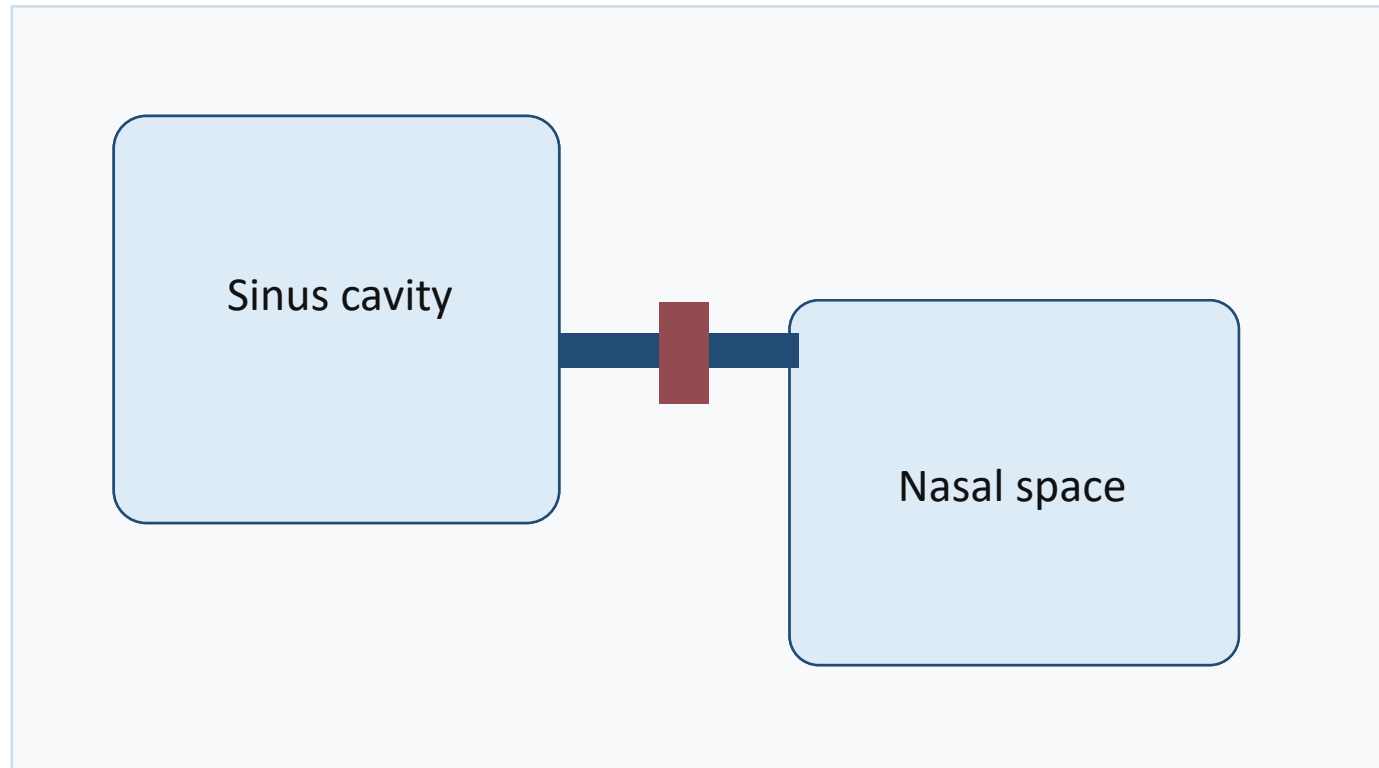
A mucocele results from accumulation of retained mucus.

Empyema

Empyema involves purulent material retained in an infected sinus.

Both implicate impaired drainage, but the contents differ.

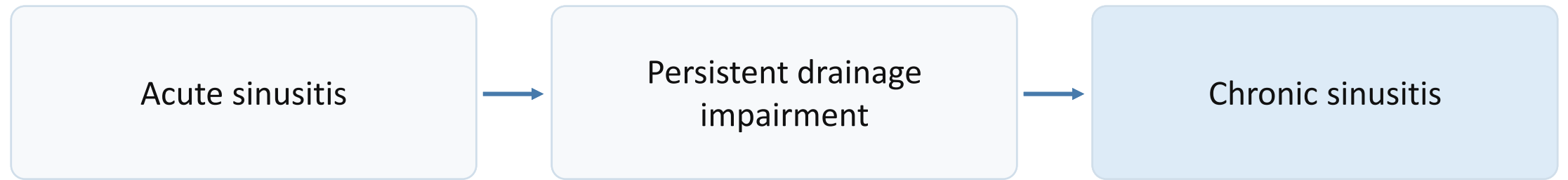
Anatomic sites of outflow obstruction



- Frontal sinus drainage is most often affected in the source account.
- Anterior ethmoid outflow obstruction is another less common site.
- These blockages can permit abnormal accumulation of secretions.

Schematic — not a clinical or histologic specimen

Acute sinusitis can progress to chronic disease



Polymicrobial chronic sinusitis

- Most chronic sinus infections in the source are polymicrobial.
- Microbes often include members of the normal oral microbial community.
- This is different from assuming a single named pathogen in every patient.

Inherited ciliary dysfunction is another cause

Impaired ciliary action



Poor mucociliary clearance



Sinusitis in Kartagener
syndrome

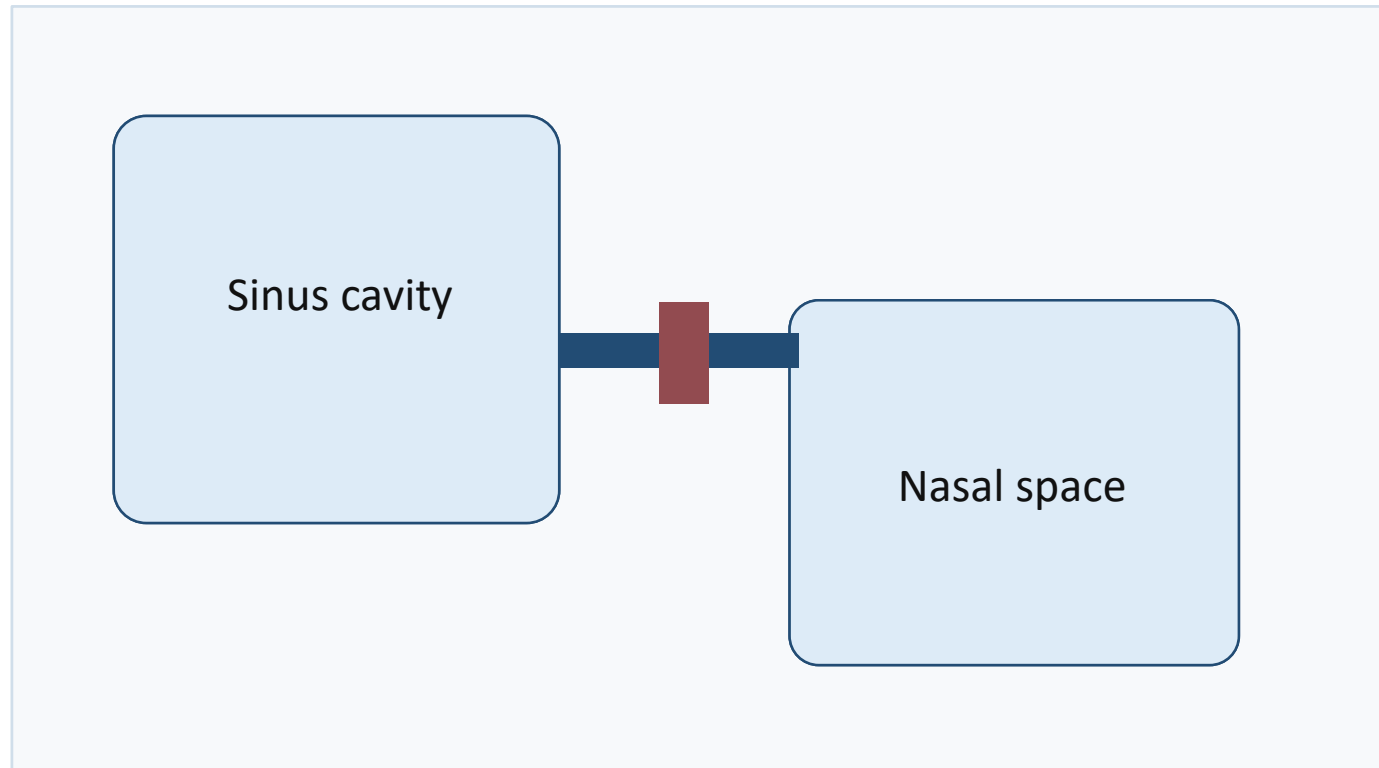
Kartagener syndrome: Associated features

- Sinusitis can be an uncommon manifestation of Kartagener syndrome.
- Bronchiectasis is also part of the described syndrome.
- Situs inversus occurs in the classic syndromic constellation.

Severe fungal sinus infection

- Fungal causes can produce severe chronic sinus infection.
- Mucormycosis is specifically highlighted in the source.
- Diabetes is a relevant predisposing clinical context.

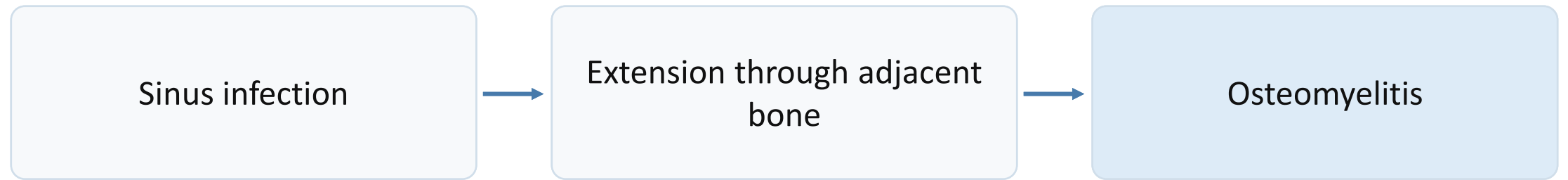
Spread from sinus to the orbit



- Sinus infection can occasionally extend into the orbital region.
- This represents extension beyond the local mucosal compartment.
- Orbital spread is a serious but uncommon consequence.

Schematic — not a clinical or histologic specimen

Spread into bone: Osteomyelitis



Intracranial venous complication

Severe sinus infection

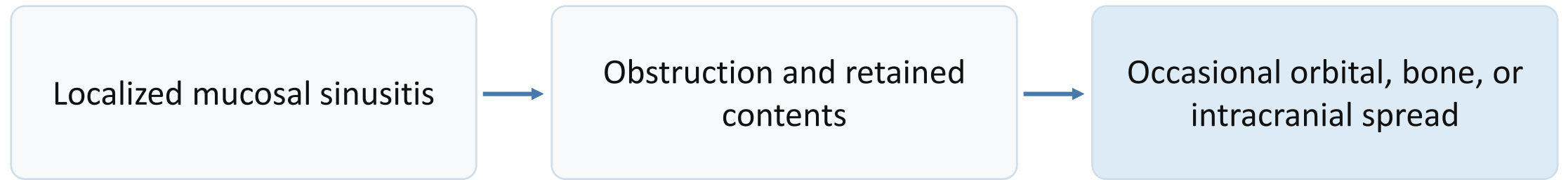


Extension into cranial vault



Septic dural venous
thrombophlebitis

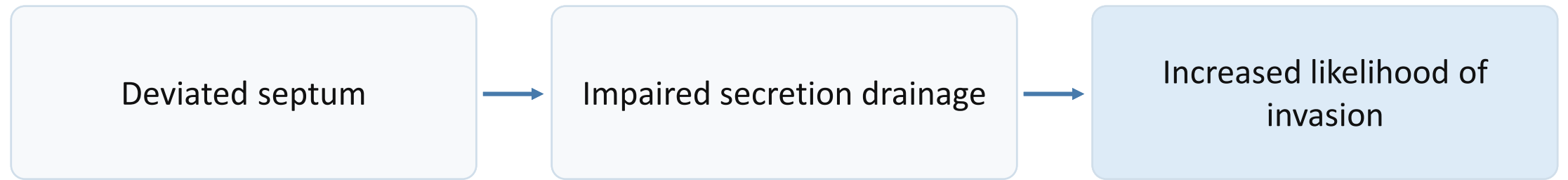
Complications follow a severity hierarchy



Case 1: Septal obstruction

- A patient experiences repeated inflammatory episodes of rhinitis.
- A deviated septum impedes the normal flow of secretions.
- Question: Which functional change increases microbial susceptibility?

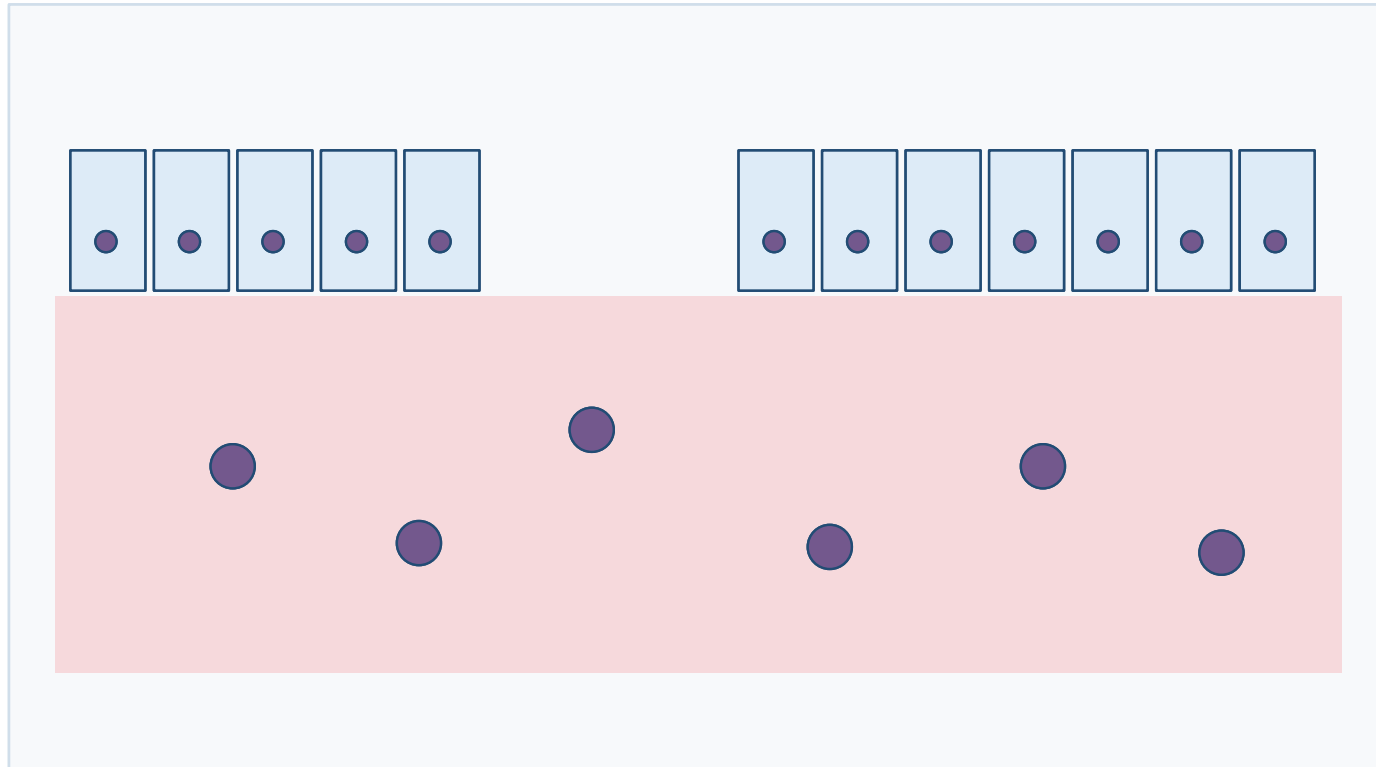
Case 1: The relevant intermediate step



Case 2: A nasal mucosal specimen

- Histology shows superficial desquamation of nasal epithelium.
- Neutrophils, lymphocytes and plasma cells are found in the mucosa.
- Question: Which elements match the chronic-rhinitis description?

Case 2: Morphological interpretation



Schematic — not a clinical or histologic specimen

- Surface epithelial injury corresponds to desquamation or ulceration.
- The infiltrate matches the described variable inflammatory-cell mixture.
- These findings alone do not identify an individual organism.

Case 3: Obstruction by nasal polyps

- Repeated rhinitis is followed by formation of multiple large polyps.
- The sinus outflow tract becomes obstructed.
- Question: What two different types of sinus retention may occur?

Case 3: Retained mucus versus pus

Mucocele

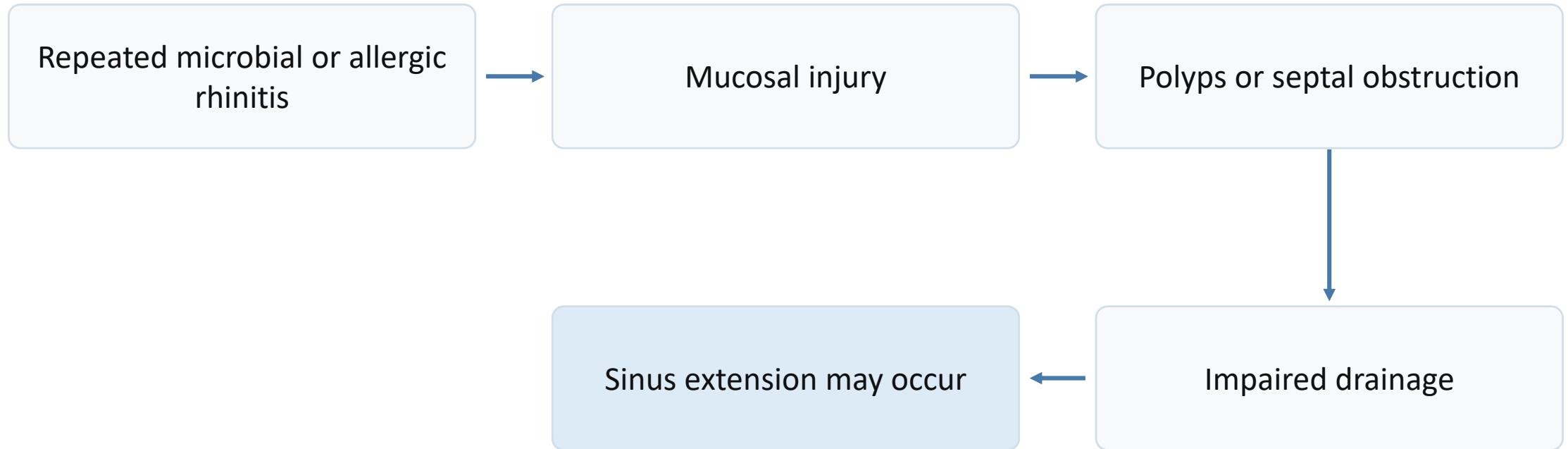
Mucocele denotes mucus accumulation behind obstruction.

Empyema

Empyema denotes accumulation of purulent material.

Both connect to impaired outflow but describe different contents.

Unified clinicopathologic model



Teaching synthesis

- Repeated microbial or allergic rhinitis can precede chronic mucosal inflammation.
- The principal histologic findings are epithelial injury and a mixed cellular infiltrate.
- Drainage impairment links nasal disease to bacterial infection and sinusitis.

References

- Robbins, Cotran & Kumar. Pathologic Basis of Disease. Eleventh edition. Elsevier, 2026.
- Relevant contiguous sections: Infectious Rhinitis; Allergic Rhinitis; Nasal Polyps; Chronic Rhinitis; Sinusitis.