



Brigham and Women's Hospital
Founding Member, Mass General Brigham

Key Clinical Cases in Dermatology

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**CONTINUING MEDICAL EDUCATION
DEPARTMENT OF MEDICINE**

Beth Israel Lahey Health 
Lahey Hospital & Medical Center



**HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL**

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- University of Pennsylvania School of Medicine
- Internship in Internal Medicine @ MGH
- Residency: Harvard Combined Dermatology Program
- Dermatology Chair @ Lahey Hospital & Med Center
- Assistant Professor, Part-time @ HMS
- Director of the Lahey Skin Infection Program

Disclosures

- I have no relevant financial relationships with ineligible companies.
- Will discuss off-label use of medications

Objectives

Use case vignettes to help the participants:

- Optimize management of simple cellulitis
- Recognize an several key eruptions that are easy to miss
- Distinguish allergic contact dermatitis from infection (time-permitting)

Case

18 yo female transferred from OSH for 2 complaints:

1. Abdominal pain x 4 years
2. Pruritic Rash x 6 months

Both undiagnosed despite extensive workup

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Case

Diagnosis?

- A. Dermatitis Herpetiformis
- B. Eczema
- C. Scabies
- D. Neurotic Excoriations



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European Journal of Internal Medicine

Volume 18, Issue 5, September 2007, Pages 445-446



Letter to the Editor

A case of scabies masquerading as drug eruption

Toshiro Sugimoto Atsunori Kashiwagi

Infantile Scabies Masquerading as Langerhans Cell Histiocytosis

Yoon Seok Yang, Yun Sun Byun, Jin Hye Kim, Hye One Kim, Chun Wook Park

Department of Dermatology, Hallym University College of Medicine, Seoul, Korea

Misdiagnosed Crusted Scabies in an Adult Leads to Hyperinflammation

Scabies masquerading as Letterer-Siwe's disease.

K Aterman; V W Krause; J B Ross

ISSN: 0820-3946, 0820-3946

CMAJ : Canadian Medical Association journal = journal de l'Association médicale canadienne. , 1976, Vol.115(5), p.443-444

A case of bullous scabies misdiagnosed as acquired epidermolysis bullosa

Asli Akin Belli MD Nazmi Geyik MD, Emine Dervis

First published: 30 July 2015 | <https://doi.org/10.1111/ijd.12920>

Norwegian scabies misdiagnosed as an adverse drug reaction

Scabies Masquerading as Dermatitis Herpetiformis

A. Bernard Ackerman, MD; Roger Stewart, MD; Michael Stillman, MD

JAMA. 1975;233(1):53-54. doi:10.1001/jama.1975.03260010055023

Aksoy Gökmen

Crusted Scabies Misdiagnosed as Erythrodermic Psoriasis in a 3-Year-Old Child

Pediatric Dermatology



Dermatology Online Journal || Letter

Volume 24 Number 6 | June 2018 |
24(6): 18

Crusted scabies masquerading as psoriasis plaques in a patient suffering from burn scars

MILAGROS SANCHEZ M.D.

First published: 03 August 2009 |

and Philip R Cohen²

Scabies masquerading as an adverse drug reaction.

D Svecova; N Chmurova; A Pallova; P Babal

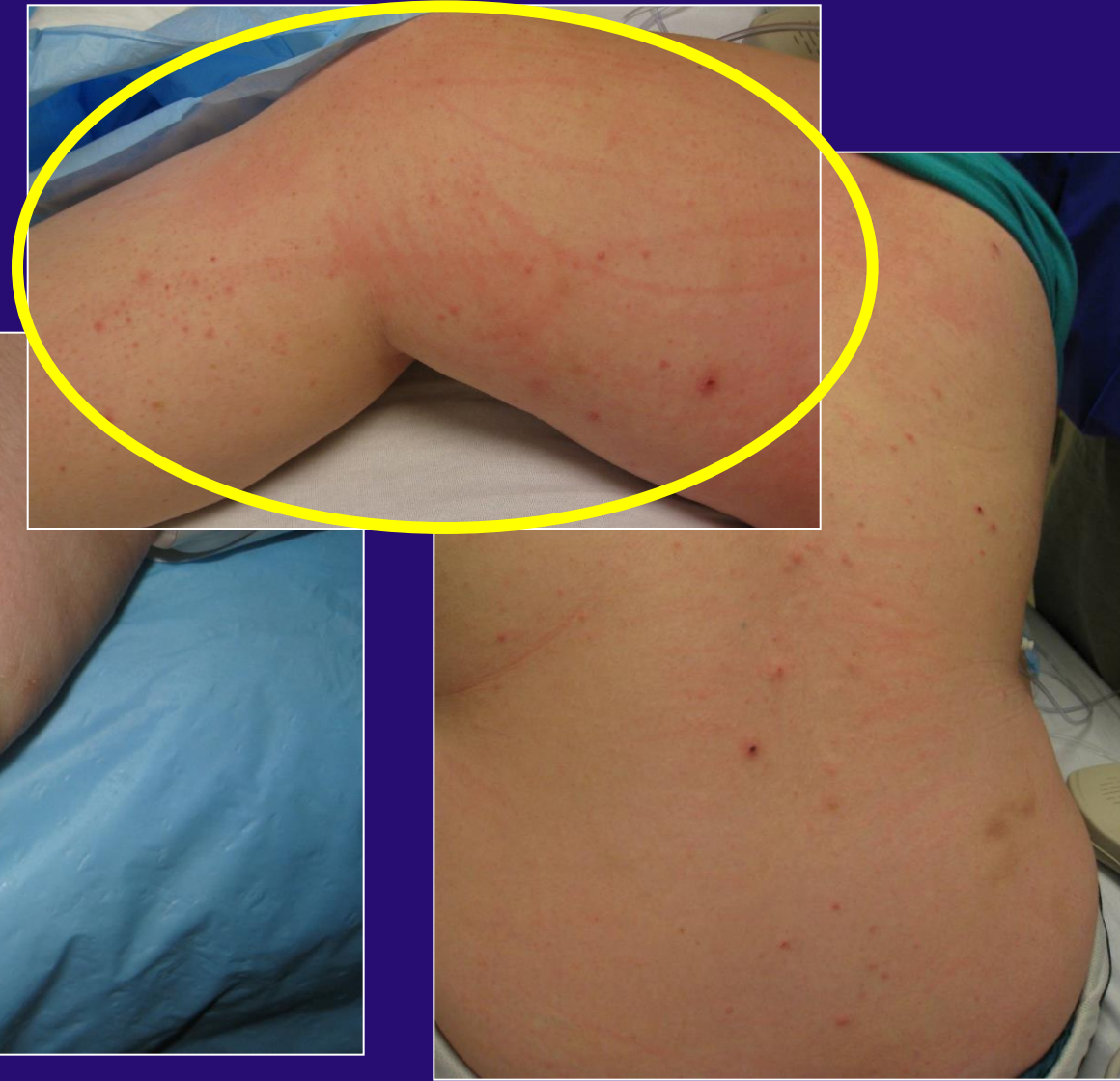
ISSN: 1210-7913, 1210-7913

Epidemiol Mikrobiol Imunol, 2009, Vol.58(3), p.121-123

Case

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Case

Diagnosis?

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Diagnosis?

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Scabies: Diagnostic Pearls

**Burrows
and the
“Delta Wing Sign”**

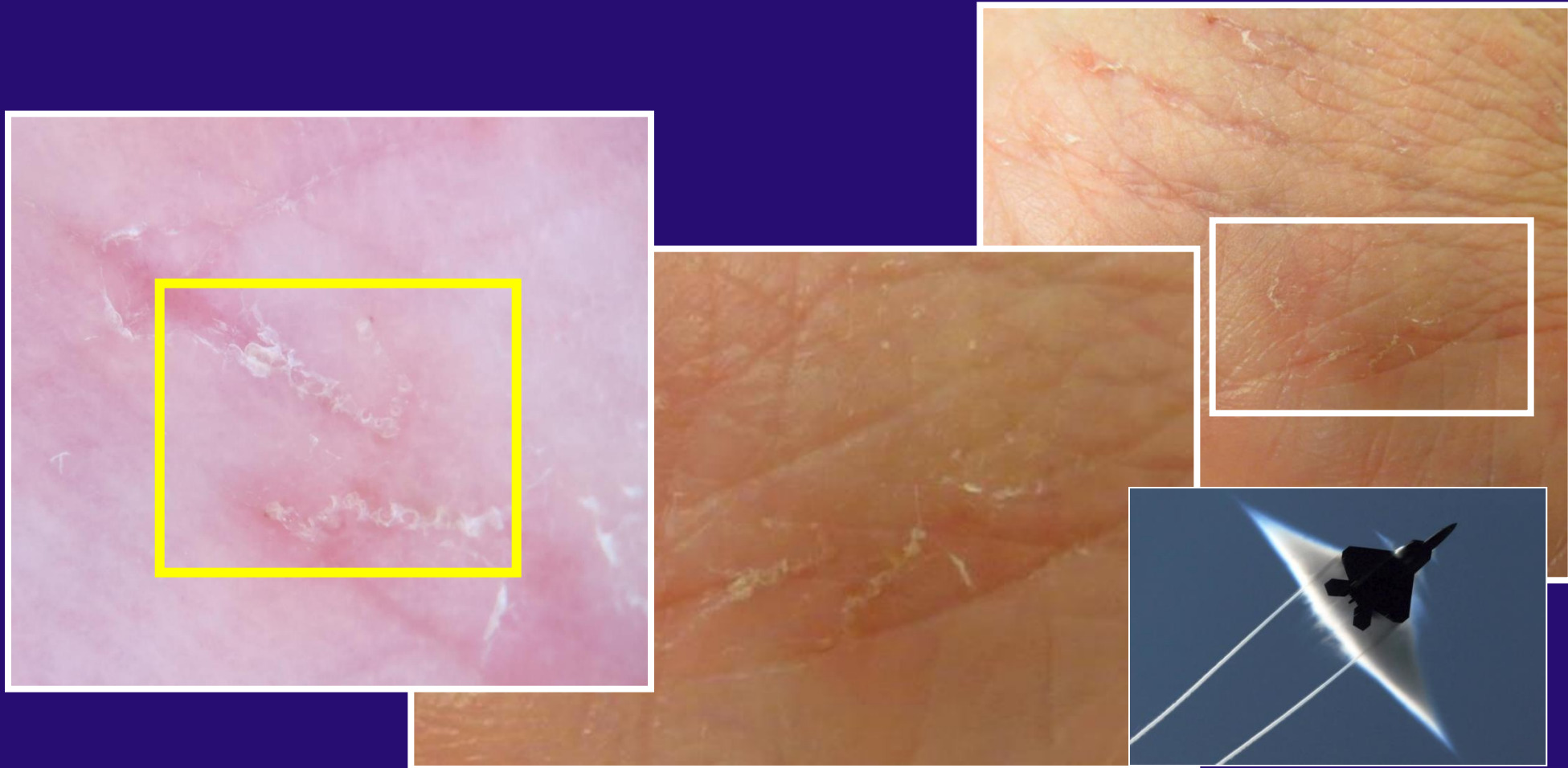


Scabies: Diagnostic Pearls

**Burrows
and the
“Delta Wing Sign”**



Scabies: Diagnostic Pearls

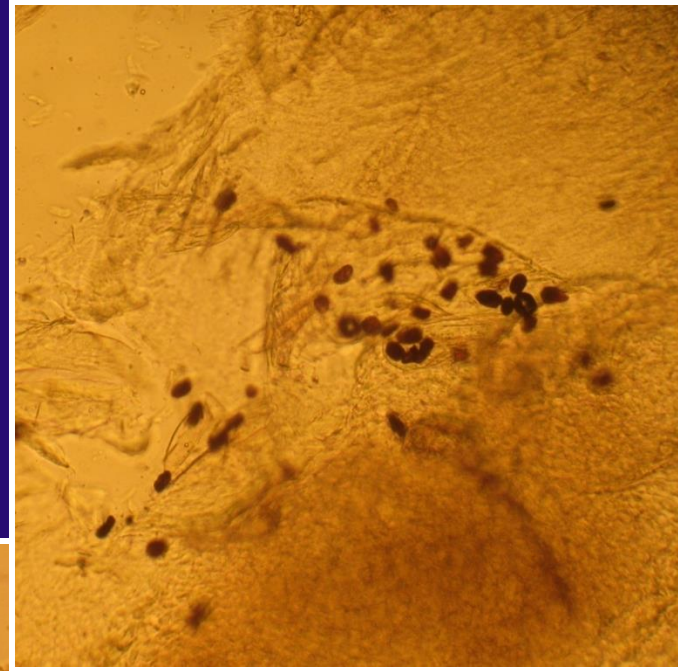
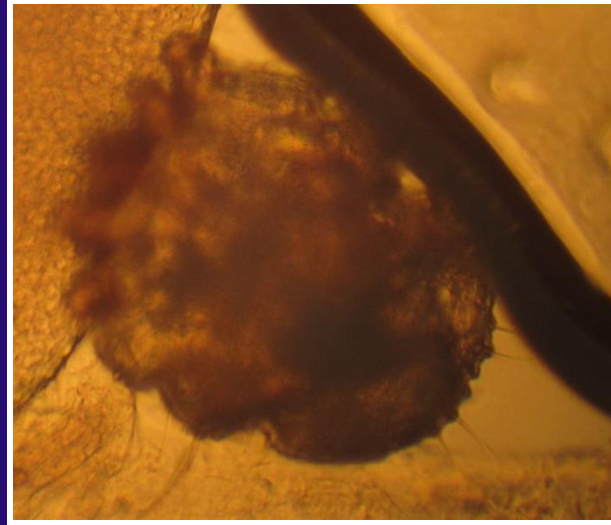


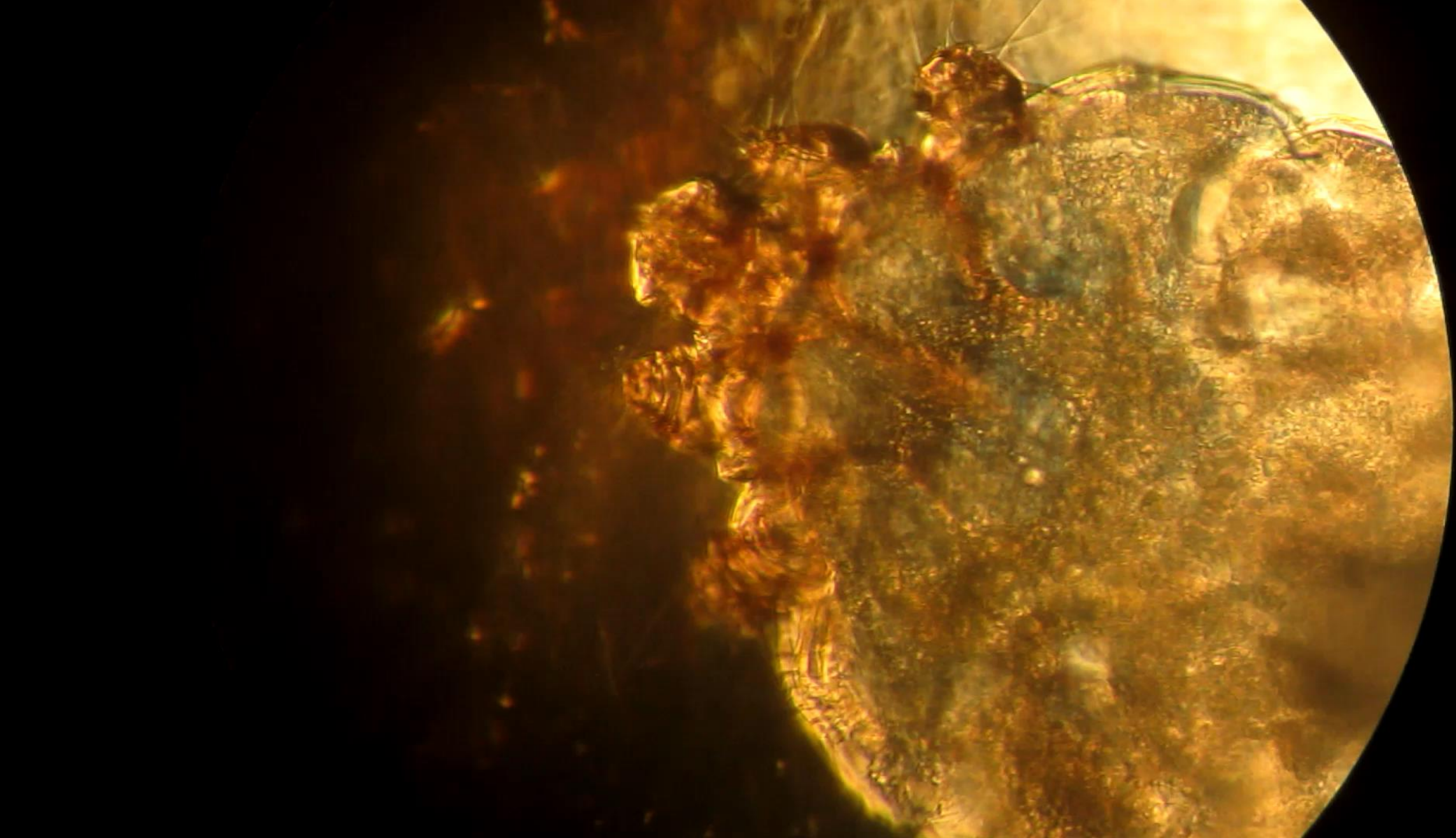
*Argenziano G, Fabbrocini G, Delfino M. Epiluminescence Microscopy: A New Approach to In Vivo Detection of *Sarcoptes scabiei*. *Arch Dermatol.* 1997;133(6):751–753.

Scabies: Diagnostic Pearls



Scabies: Diagnostic Pearls





Scabies Management

Topical Permethrin or PO Ivermectin
for patient and all household & sexual contacts

- Topical Permethrin 5%:
 - Neck down, including all folds
 - 8-14 hours (overnight)
 - Wash & Dry all bedclothes and bedding high heat
 - Shower
 - Repeat 10 days later
- PO Ivermectin: 200mcg/kg x 1, repeat 10 days later
 - Wash & Dry all bedclothes and bedding high heat
 - Shower

Scabies Management: Topical Permethrin vs PO Ivermectin



“Oral ivermectin (at a standard dose of 200 µg/kg) may lead to slightly lower rates of complete clearance after one week compared to permethrin 5% cream.... However, by week two there may be little or no difference ”

Oral ivermectin versus 5% permethrin cream to treat children and adults with classic scabies: multicentre, assessor blinded, cluster randomised clinical trial

Table 3 | Clinical cure rates for scabies on day 28 in ivermectin and permethrin groups

Analysis unit	Cure rate (%) or No/Total No of cures (%)		Cures rate difference (percentage points (95% CI))
	Ivermectin	Permethrin	
Clusters:			
No of clusters	142	147	—
Main analysis with multiple imputation (%)*	71.8	88.5	−16.7 (−26.3 to −7.1)
Completer participant†	94/132 (71.2)	114/127 (89.8)	−18.5 (−28.7 to −8.3)
Compliant participants‡	89/119 (74.8)	102/107 (95.3)	−20.2 (−30.0 to −10.4)

SUMMARY	Ivermectin	Permethrin
Compliance:	84%	73%
Cure rate:	71.8%	88.5%

Conclusion: Permethrin is superior, even with real-world compliance challenges

Case

- 54 yo F
- 5 days s/p excision of a BCC
- Progressive peri-incisional redness and pain
- Malaise
- Temp 100.5



Cellulitis



**Which of the following characteristics is
most SENSITIVE for cellulitis?**

- A. Tenderness
- B. Fever
- C. Leukocytosis
- D. Pruritus
- E. Malaise

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Management of Cellulitis

To cover MRSA or NOT to cover MRSA?

Management of Cellulitis

STEP 1: Cellulitis or NOT Cellulitis?

JAMA Dermatology | **Original Investigation**

Costs and Consequences Associated With Misdiagnosed Lower Extremity Cellulitis

Qing Yu Weng, MD; Adam B. Raff, MD, PhD; Jeffrey M. Cohen, MD; Nicole Gunasekera, BS; Jean-Phillip Okhovat, BS; Priyanka Vedak, MD; Cara Joyce, PhD; Daniela Kroshinsky, MD, MPH; Arash Mostaghimi, MD, MPA, MPH

JAMA Dermatol. doi:10.1001/jamadermatol.2016.3816
Published online November 2, 2016.

Cellulitis misdiagnosis→

- 259 pts admitted from ED with cellulitis
 - 30% did not have cellulitis. 17% did not require admission
- Extrapolation to U.S.: 50,000-130,000 unnecessary admissions
- \$195 million- \$515 million avoidable healthcare \$\$s

Step 1: Cellulitis or NOT Cellulitis?

Tender? If not, consider alternative

If tender, then:

- Bilateral? Consider alternative
- Pruritic? Consider alternative
- Geometric? Consider alternative



Step 2: consider SEVERITY

- Assessment of severity
 - Ill-appearing patient
 - Severe co-morbidities
 - Evidence of deep infection
- Management of SEVERE cellulitis:
 - Admission/Observation, Debride if needed
 - Broad spectrum IV antibiotics: Cover GAS, MRSA, MSSA, et al.

Management of NON-SEVERE Cellulitis

- Supportive care: elevation, immobilization, wound care
- Antibiotics

But which one?

- β -lactam?
- Clindamycin? Sulfa? Minocycline? Fluoroquinolone?
- 2 oral antibiotics together?
- IV vancomycin? PO linezolid? Other?

Cellulitis empiric therapy: Key principles

- Common pathogens: GAS, MSSA, CA-MRSA
- Susceptibility
 - MSSA and GAS susceptible to beta-lactams
 - MSSA and CA-MRSA *generally* susceptible to TMP-SMX
 - GAS is *unreliably* susceptible to TMP-SMX
 - Susceptibility to clinda, fluoroquinolones, tetracyclines, macrolides, etc. *varies*
- Cultures are generally low yield

Legend: GAS = Group A Streptococcus
MSSA = methicillin sensitive S. aureus
MRSA = methicillin resistant S. aureus
CA = community associated
TMP-SMX = Trimethoprim/Sulfamethoxazole

Cochrane Review 2010

Authors' conclusions:

We cannot define the best treatment for cellulitis and most recommendations are made on single trials. There is a need for trials to evaluate the efficacy of oral antibiotics against intravenous antibiotics in the community setting as there are service implications for cost and comfort.

[Read the full abstract...](#)

Kilburn SA, Featherstone P, Higgins B, Brindle R. Interventions for cellulitis and erysipelas. Cochrane Database of Systematic Reviews 2010, Issue 6. Art. No.: CD004299.

June 2013

OXFORD JOURNALS

Clinical Infectious Diseases

Clinical Trial: Comparative Effectiveness of Cephalexin Plus Trimethoprim-Sulfamethoxazole Versus Cephalexin Alone for Treatment of Uncomplicated Cellulitis: A Randomized Controlled Trial

Daniel J. Pallin,^{1,2} William D. Binder,³ Matthew B. Allen,^{1,4} Molly Lederman,^{1,5} Siddharth Parmar,¹ Michael R. Filbin,³ David C. Hooper,⁶ and Carlos A. Camargo Jr³

¹Department of Emergency Medicine, Brigham and Women's Hospital, ²Division of Emergency Medicine, Boston Children's Hospital, and ³Department of Emergency Medicine, Massachusetts General Hospital, Boston; ⁴Perelman School of Medicine at the University of Pennsylvania, Philadelphia;

⁵Department of Pediatrics, and ⁶Division of Infectious Diseases, Department of Medicine, Massachusetts General Hospital, Boston

CID 2013:56 (15 June)

Pallin et al, CID 2013

- 3 Boston Emergency Depts, 2007-11
- 153 Simple Cellulitis patients randomized



- Presence of nasal MRSA: no impact on outcome
- Conclusion: **no benefit to adding sulfa**

Moran et al, JAMA 2017

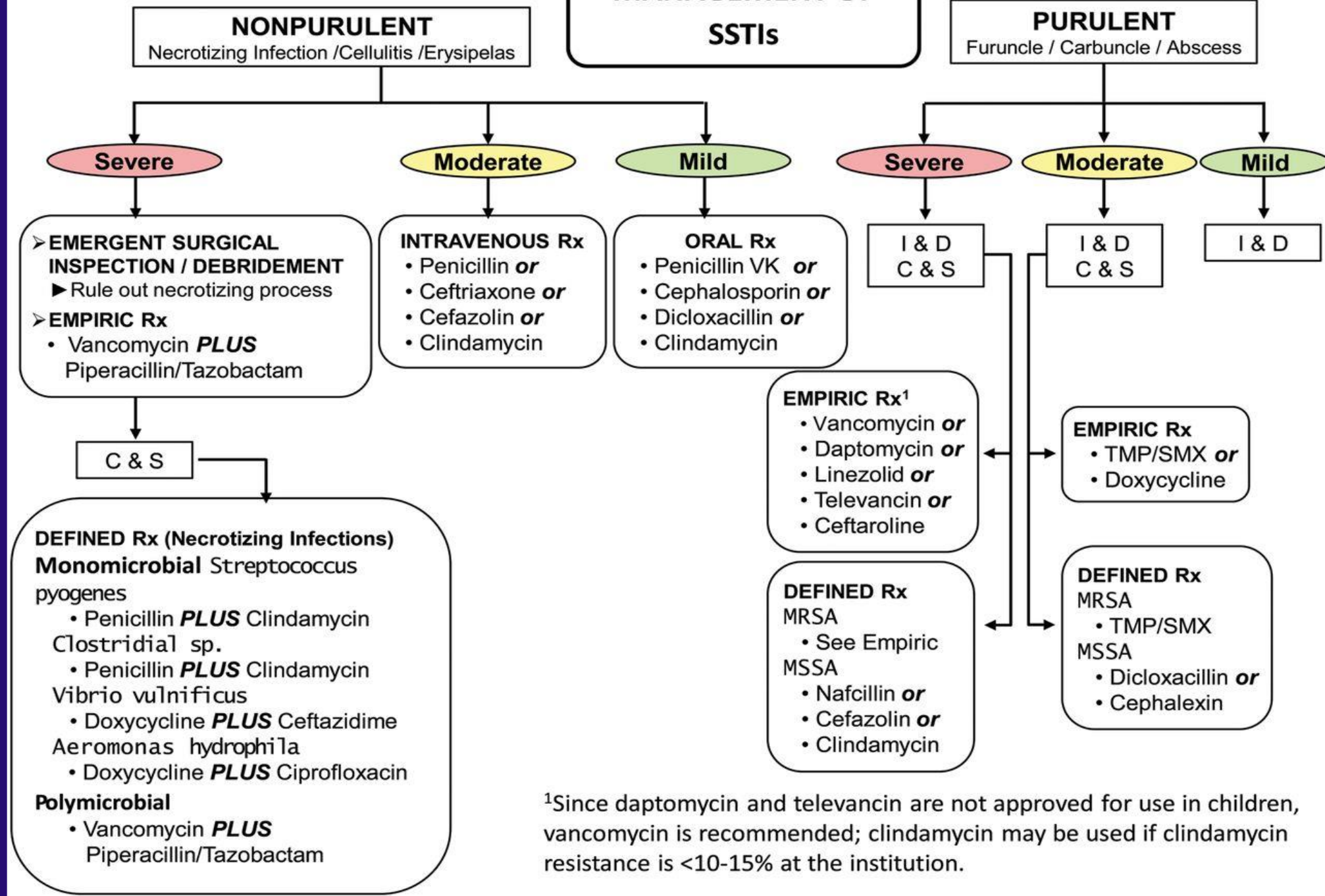
- 5 U.S. Emergency Depts, 2009-12
- 500 Simple Cellulitis patients randomized



- Conclusion: no benefit to adding sulfa
- Modified Intention-to-treat analysis “trended toward” combo therapy (7.3%, 95%CI -1.0 to 15.5%, $p = 0.07$)

IDSA GUIDELINE

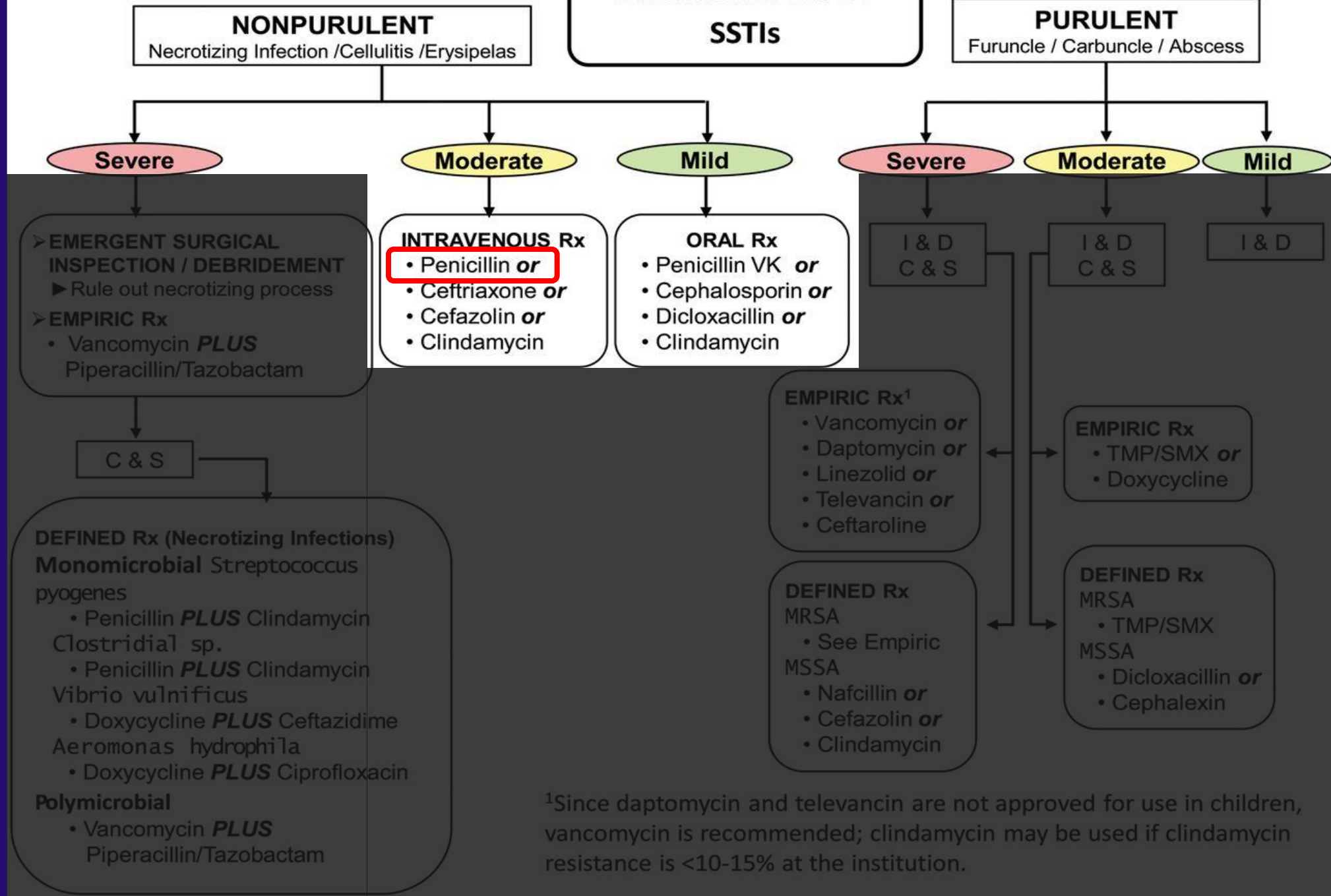
MANAGEMENT OF SSTIs



¹Since daptomycin and televancin are not approved for use in children, vancomycin is recommended; clindamycin may be used if clindamycin resistance is <10-15% at the institution.

IDSA GUIDELINE

MANAGEMENT OF SSTIs



¹Since daptomycin and televancin are not approved for use in children, vancomycin is recommended; clindamycin may be used if clindamycin resistance is <10-15% at the institution.

2014 Updated IDSA Guidelines

Caution Regarding Penicillin for Cellulitis

- Assumes Strep is dominant, minimal MSSA/MRSA
- 5 pre-1996 studies of *culture* data
- One 2010 study using **serologies & β -lactam response** (Jeng et al)
 - Study Conclusions:
 1. Serologies: “73% of non-culturable cellulitis caused by **β HS**”
 2. β -lactam response rate: 95.6%
 - **BUT!**
 - **31% lost without serologies. Intention-to-test analysis \rightarrow ~51% β HS+**
 - **They recommended cefazolin or oxacillin, which cover MSSA**
 - Only included patients admitted to hospital

Cellulitis Empiric Therapy:

Conclusions/Recommendations

- Still a moving target, but data is improving
- Anything **severe**: Admit, monitor, broad IV abx, surgery
- Beta-lactam likely best for most simple, outpatient cases
 - Strongly consider a **β -lactamase resistant agent**

Case

- 52 yo F with systemic lupus
- On mycophenolate mofetil and prednisone
- **Presents unresponsive with rash on her right leg only**
- Was well the night before
- Rapidly developed multi-organ failure in ED

Hospital Day 1



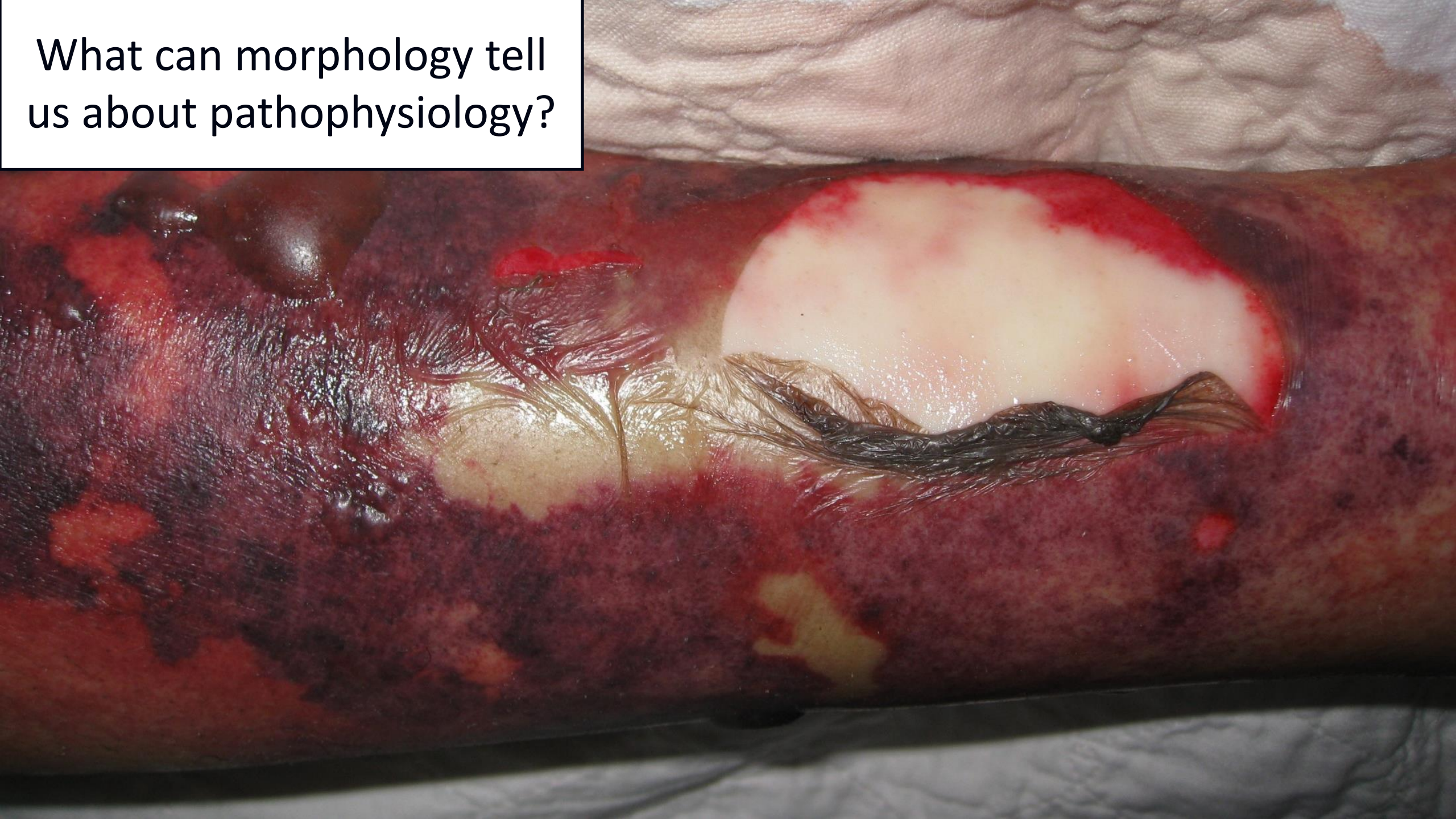


Hospital Day 3

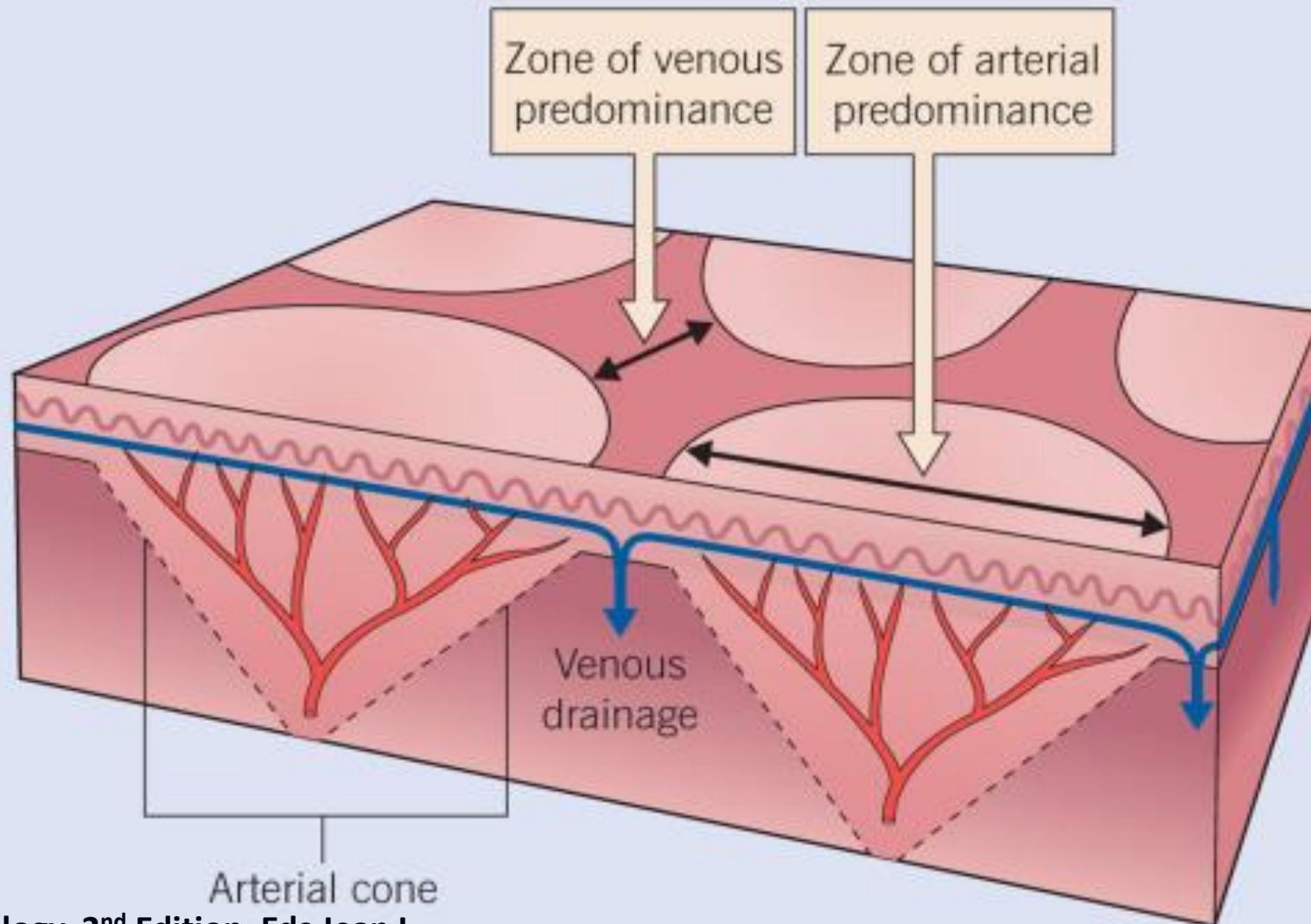


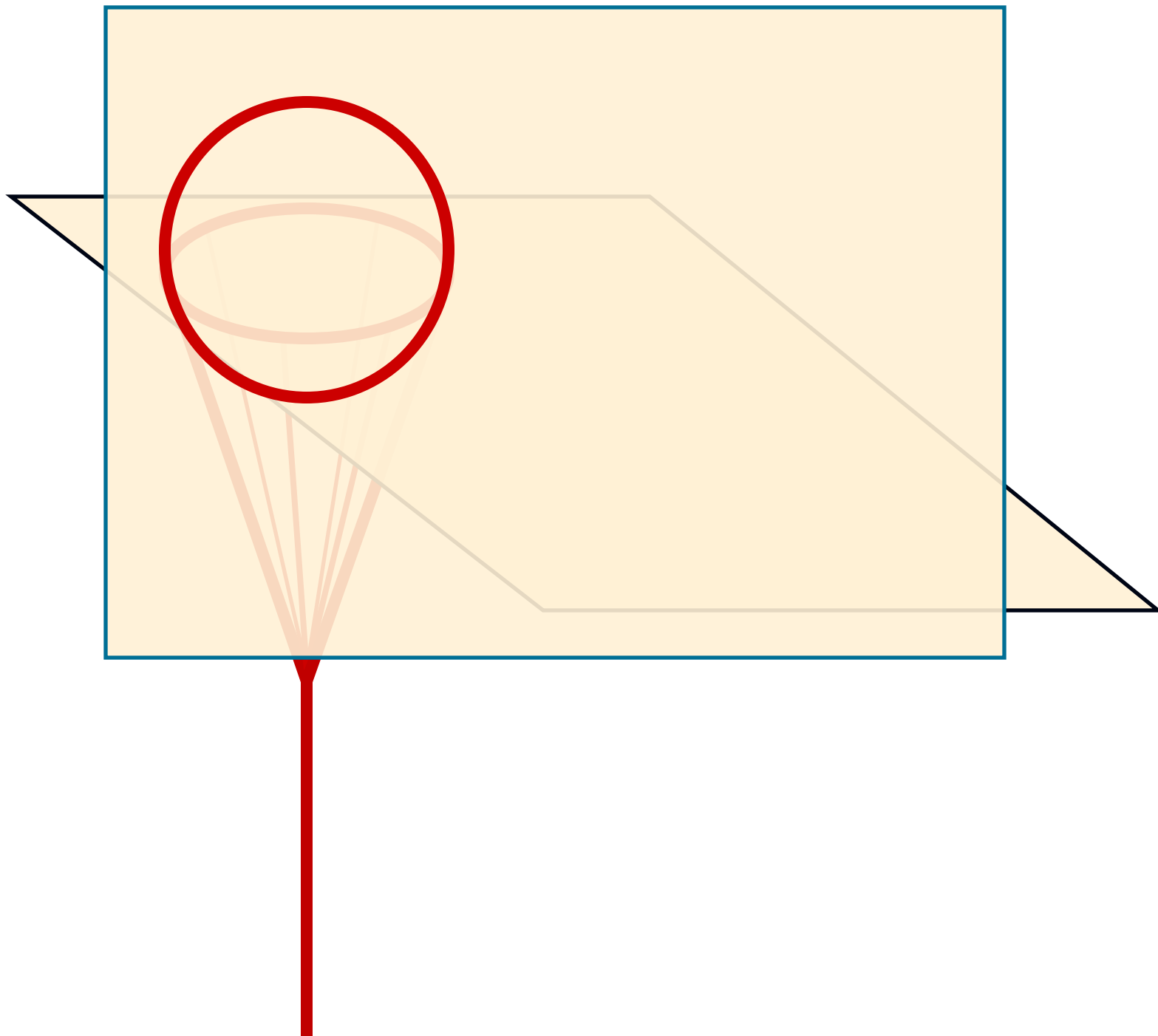


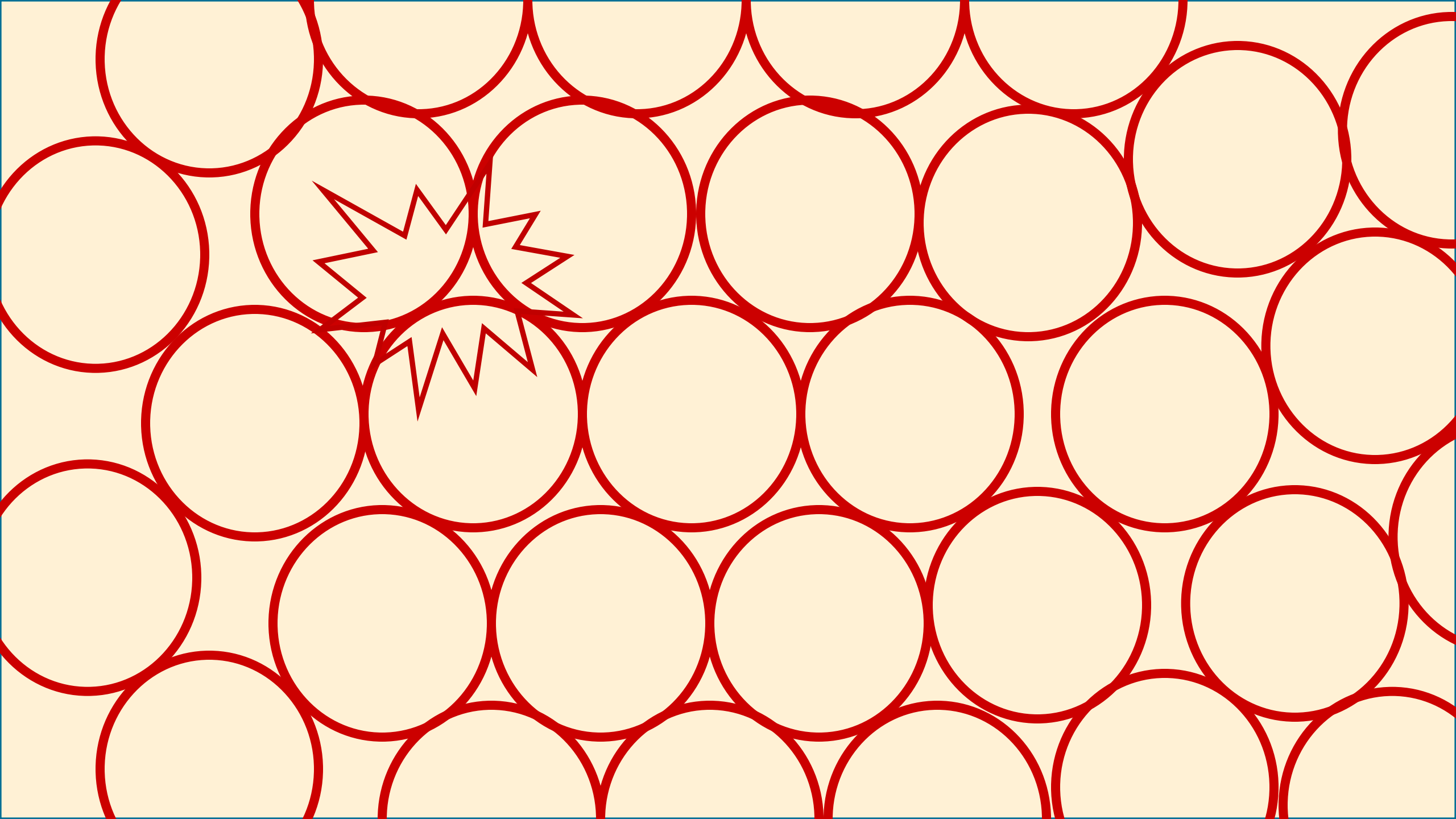
What can morphology tell us about pathophysiology?

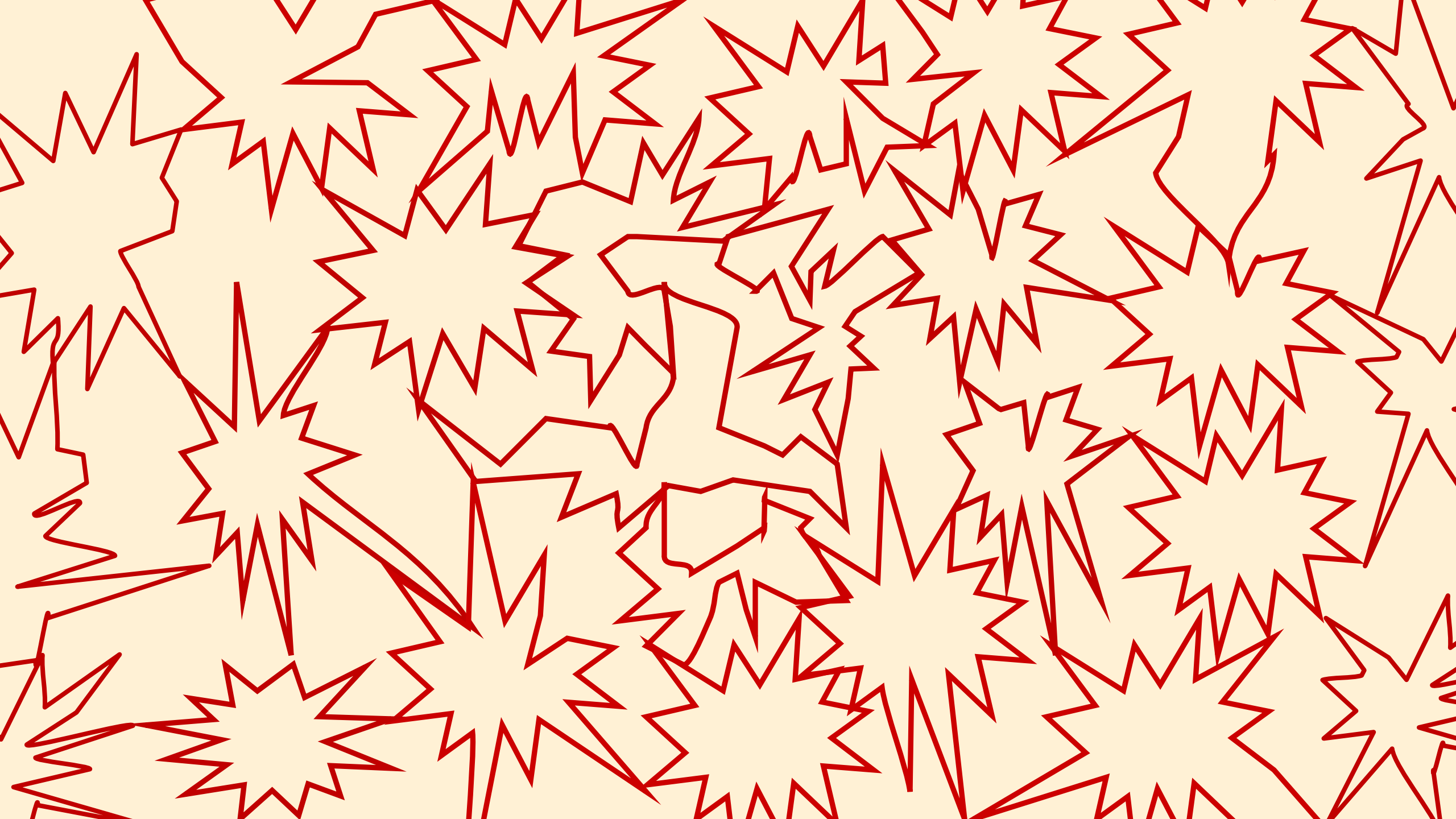


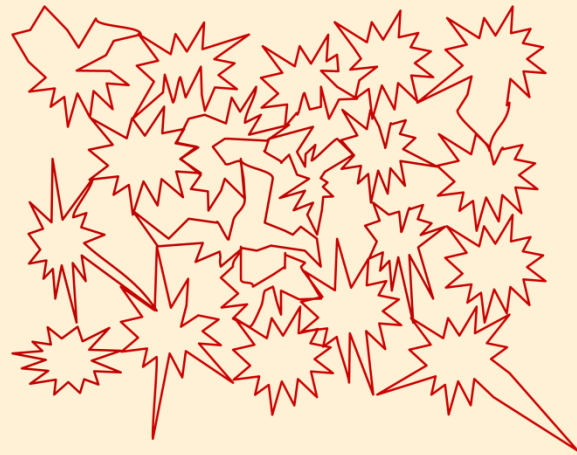
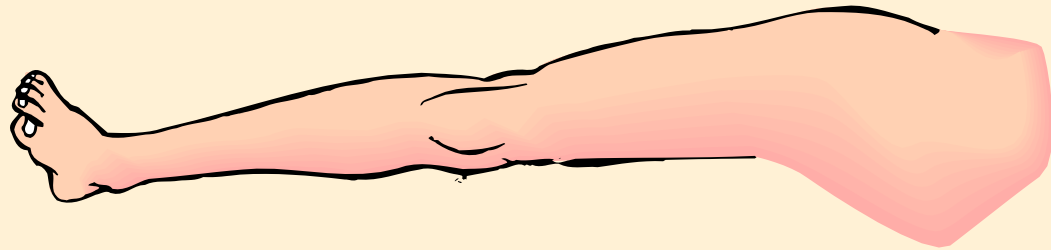
ANATOMICAL BASIS FOR THE DEVELOPMENT OF LIVEDO RETICULARIS

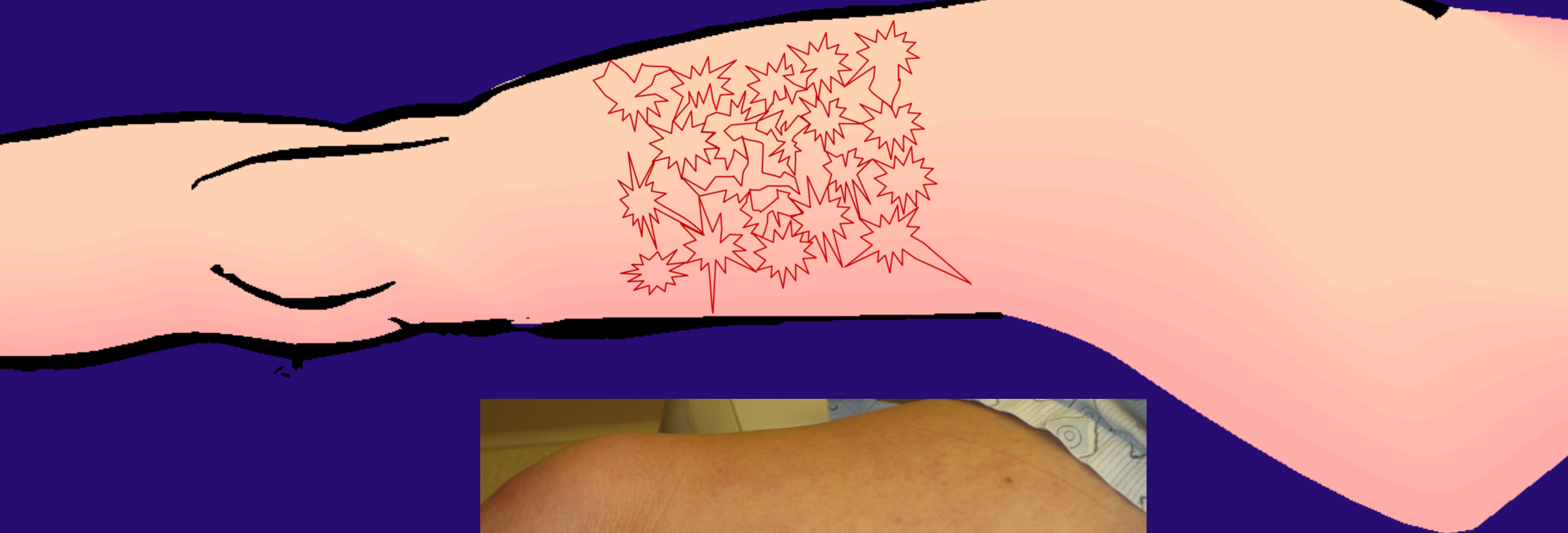












2 potential problems with this system

Problem 1: Livedo Reticularis

- Violaceous erythema
- Outlines 1-3cm stellate patches
- Surface of cones fed by individual perforating arterioles
- From enhanced visibility of zones of venous predominance
 - Increased deoxygenated blood in the venules
 - From engorged veins, constricted arterioles, local hypoxia...

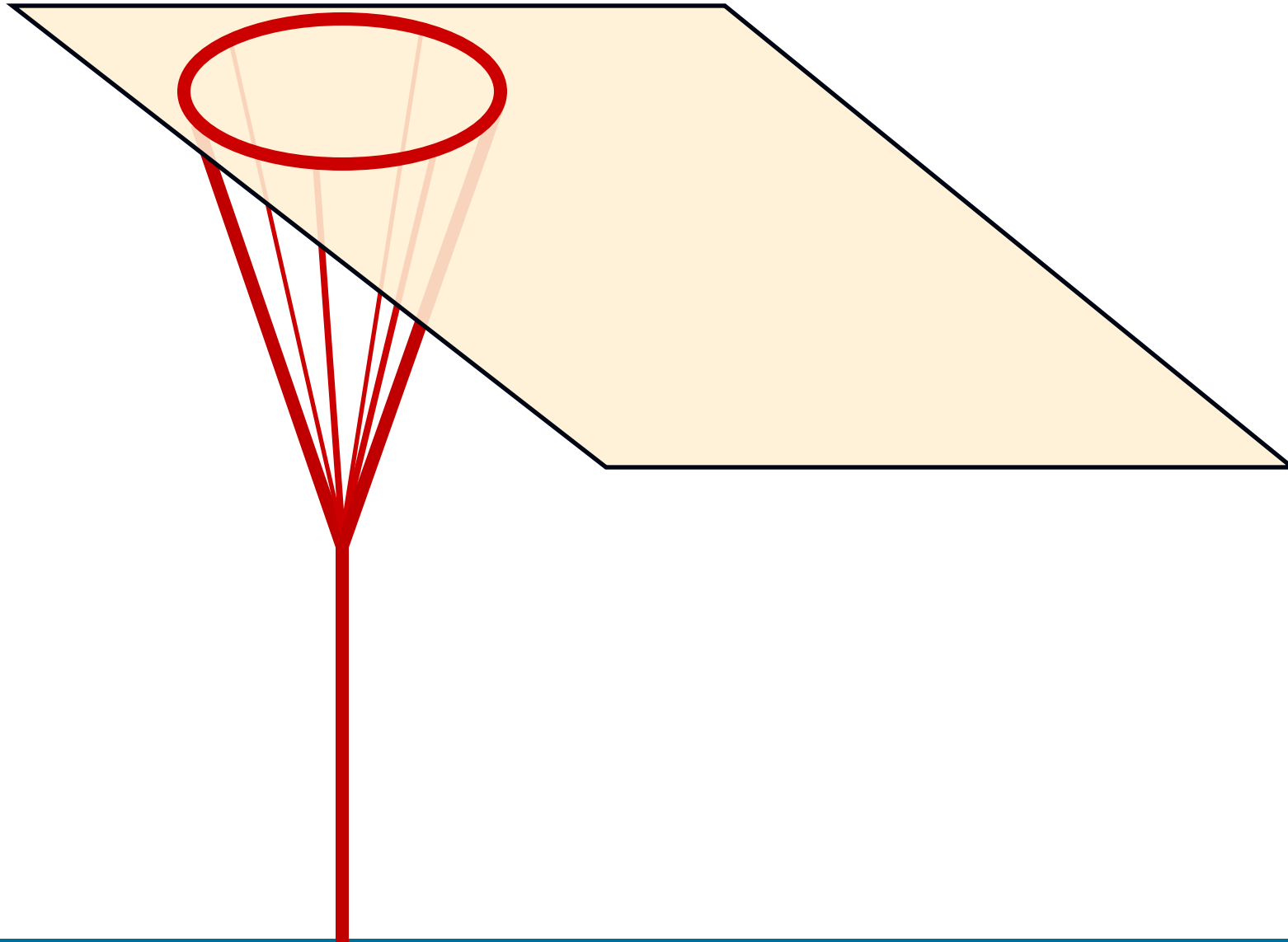
Livedo Reticularis



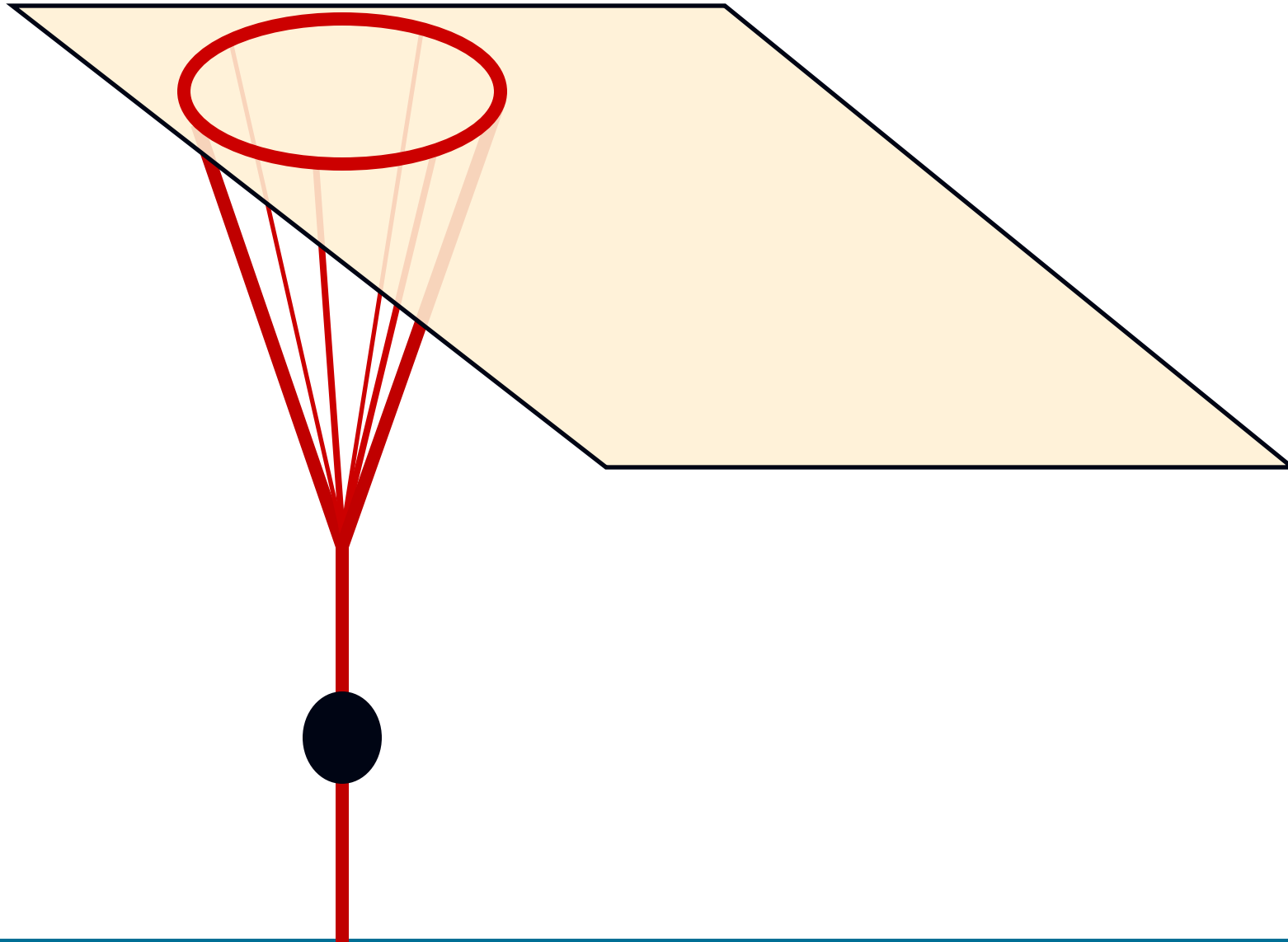
Problem 2: Retiform Purpura

- Purpura of these same stellate patches/plaques
- From occlusion of the perforating arterioles.

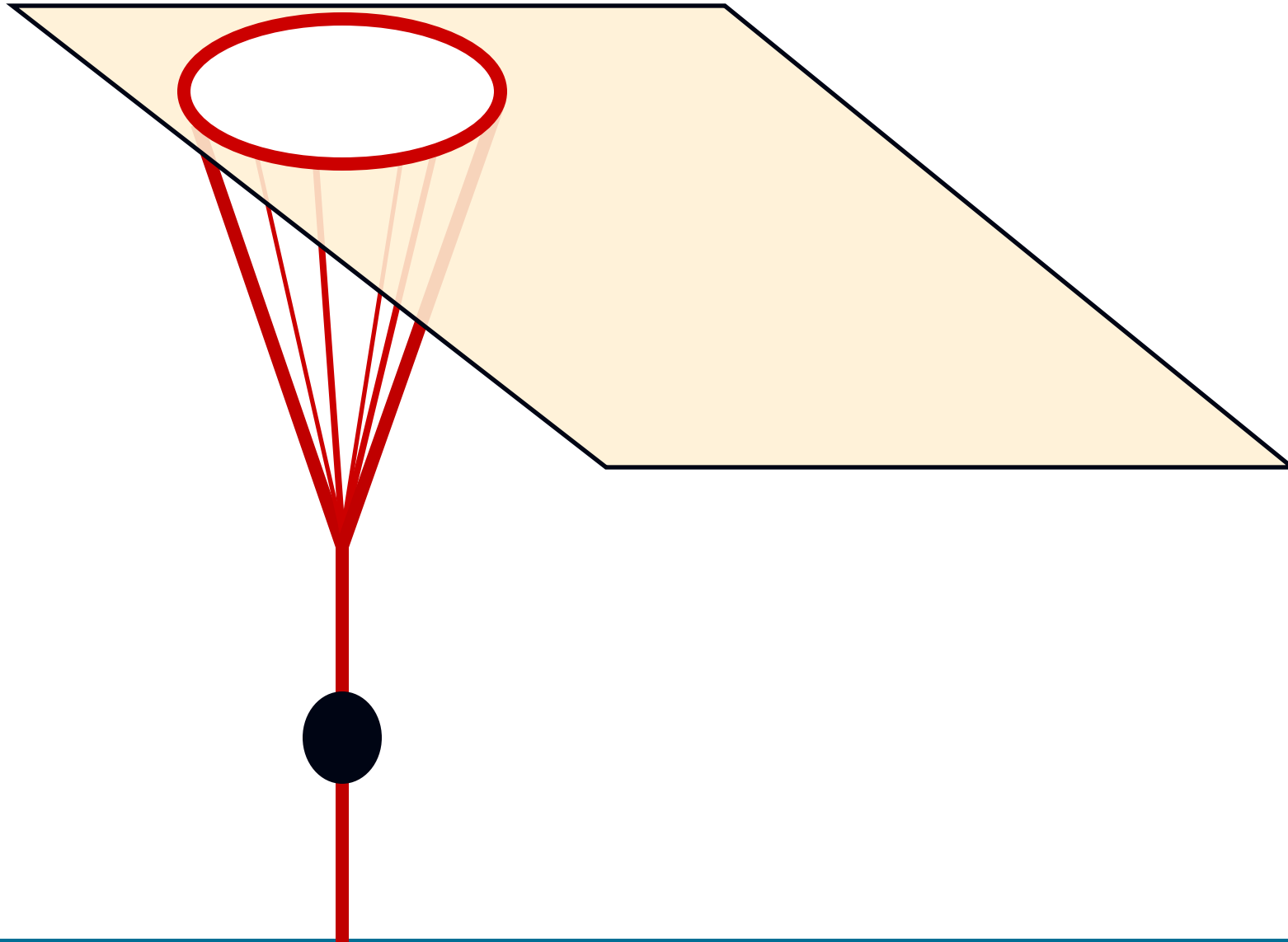
Retiform Purpura



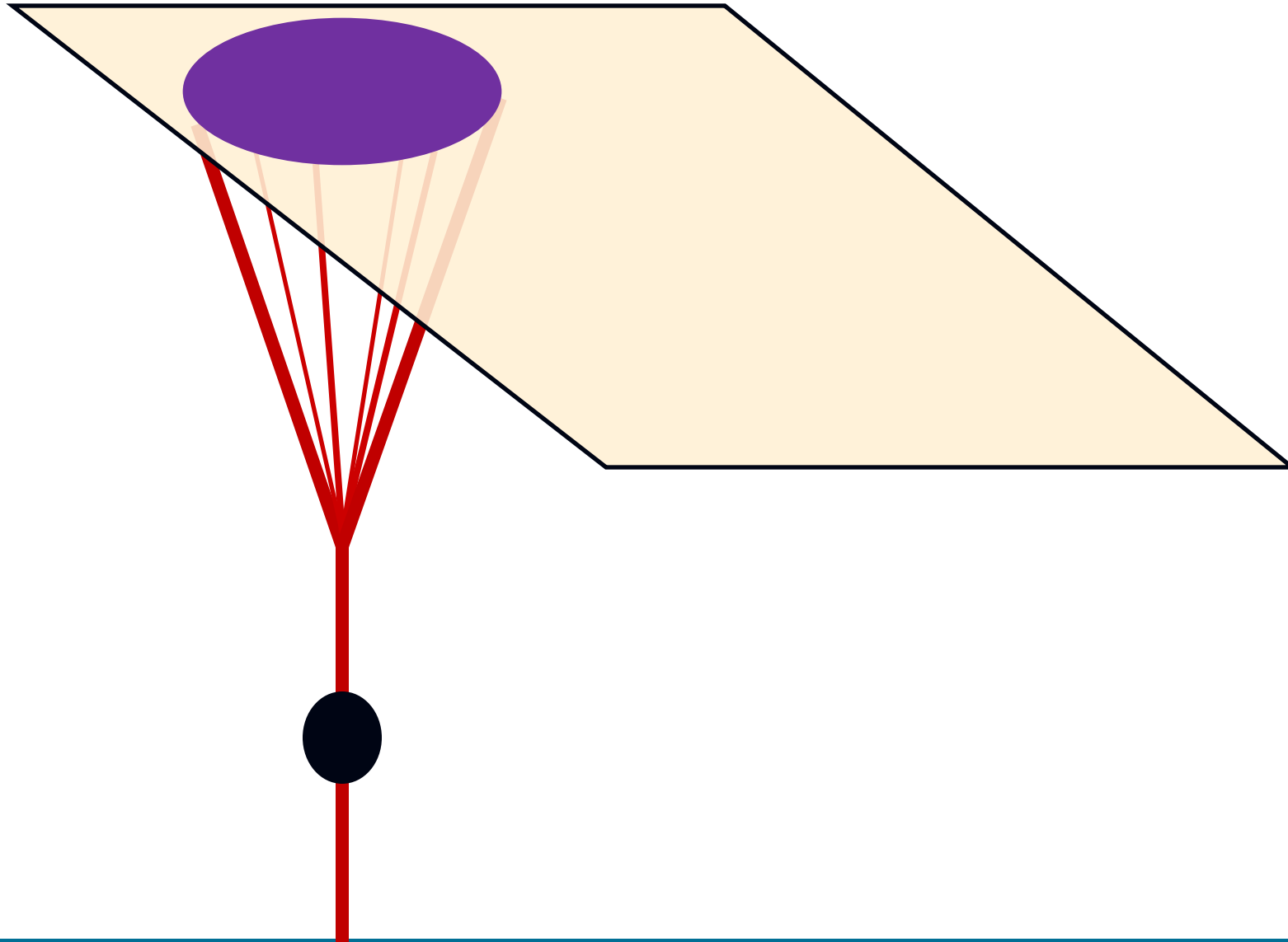
Retiform Purpura



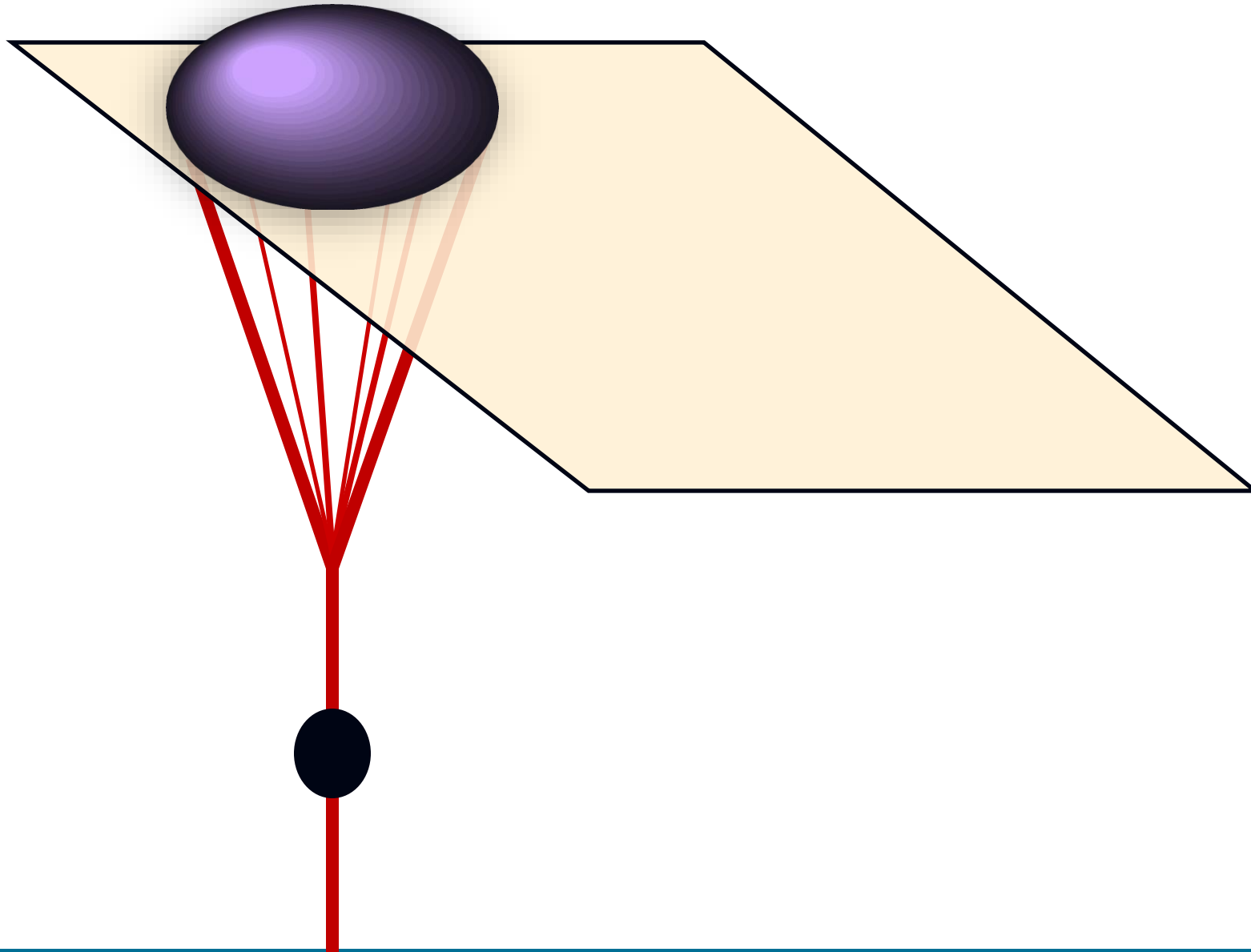
Retiform Purpura



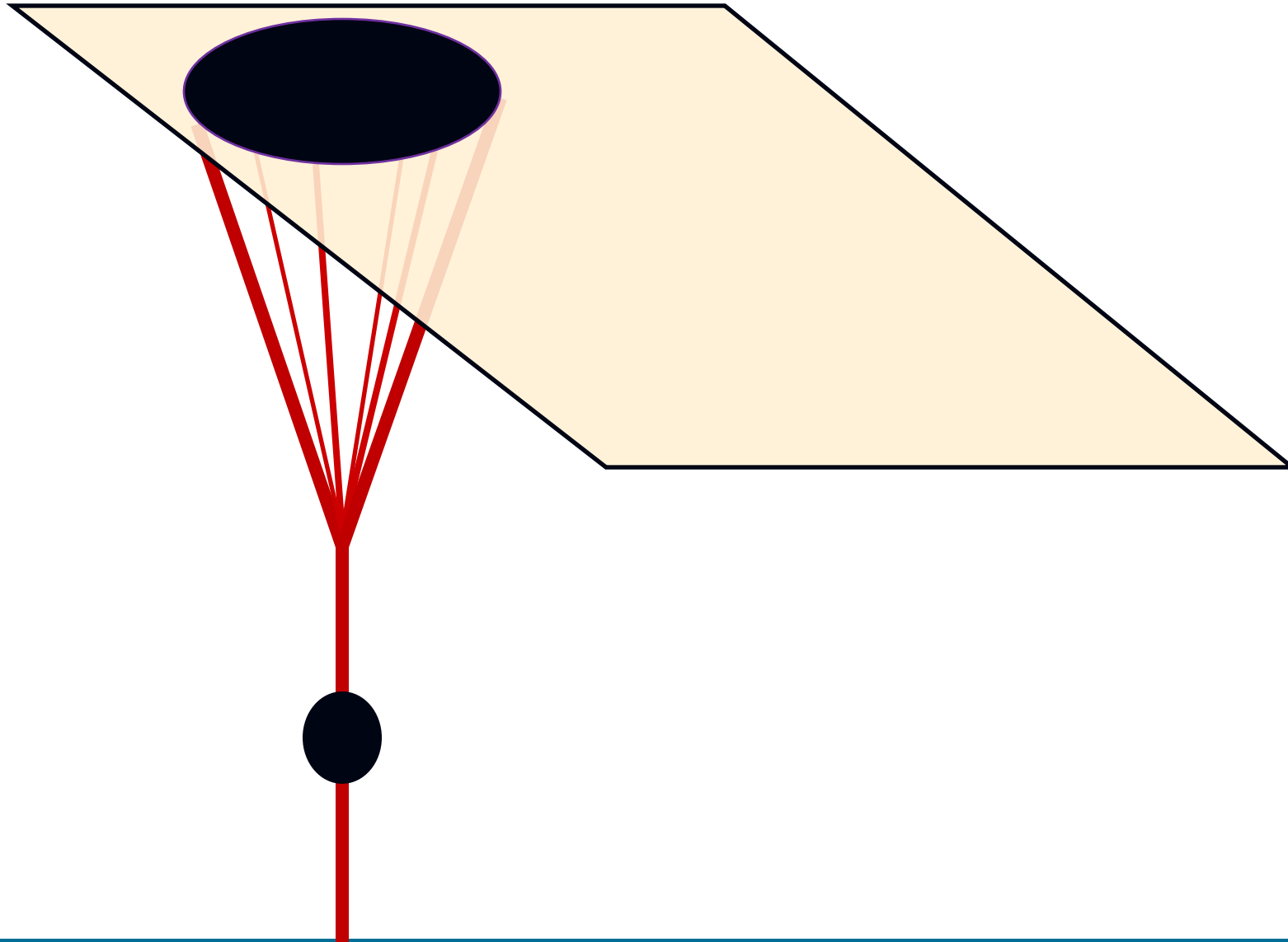
Retiform Purpura

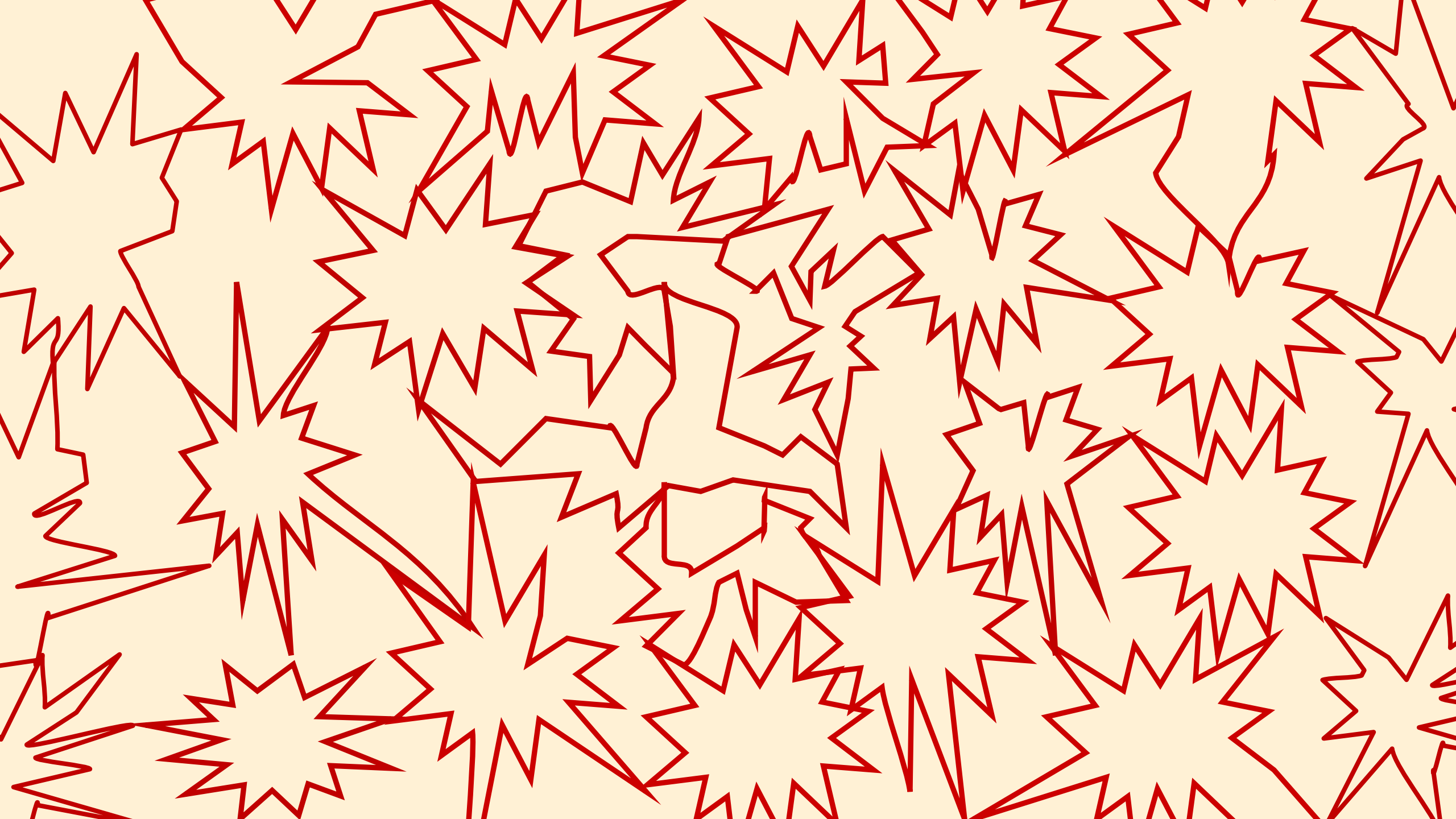


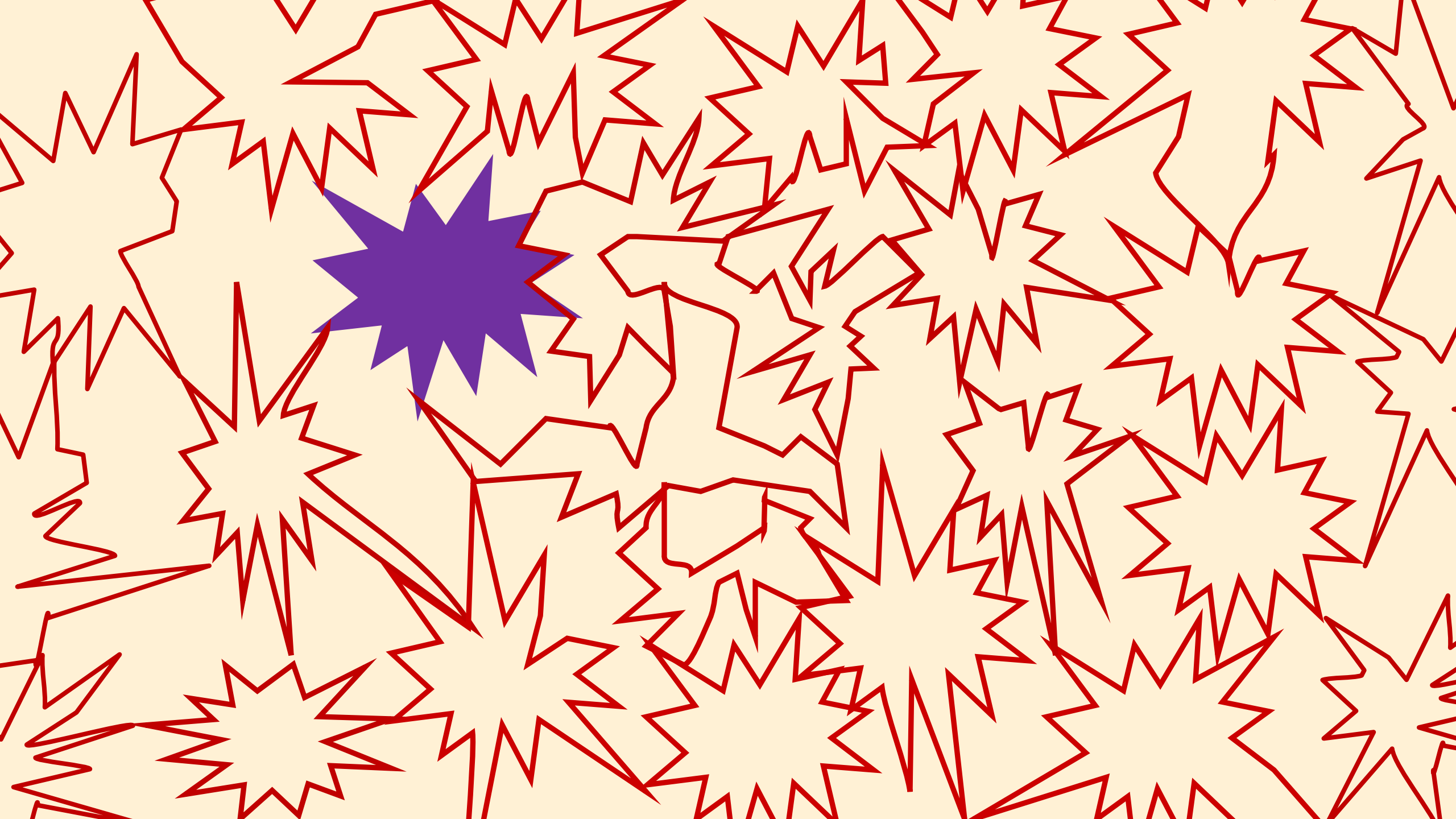
Retiform Purpura

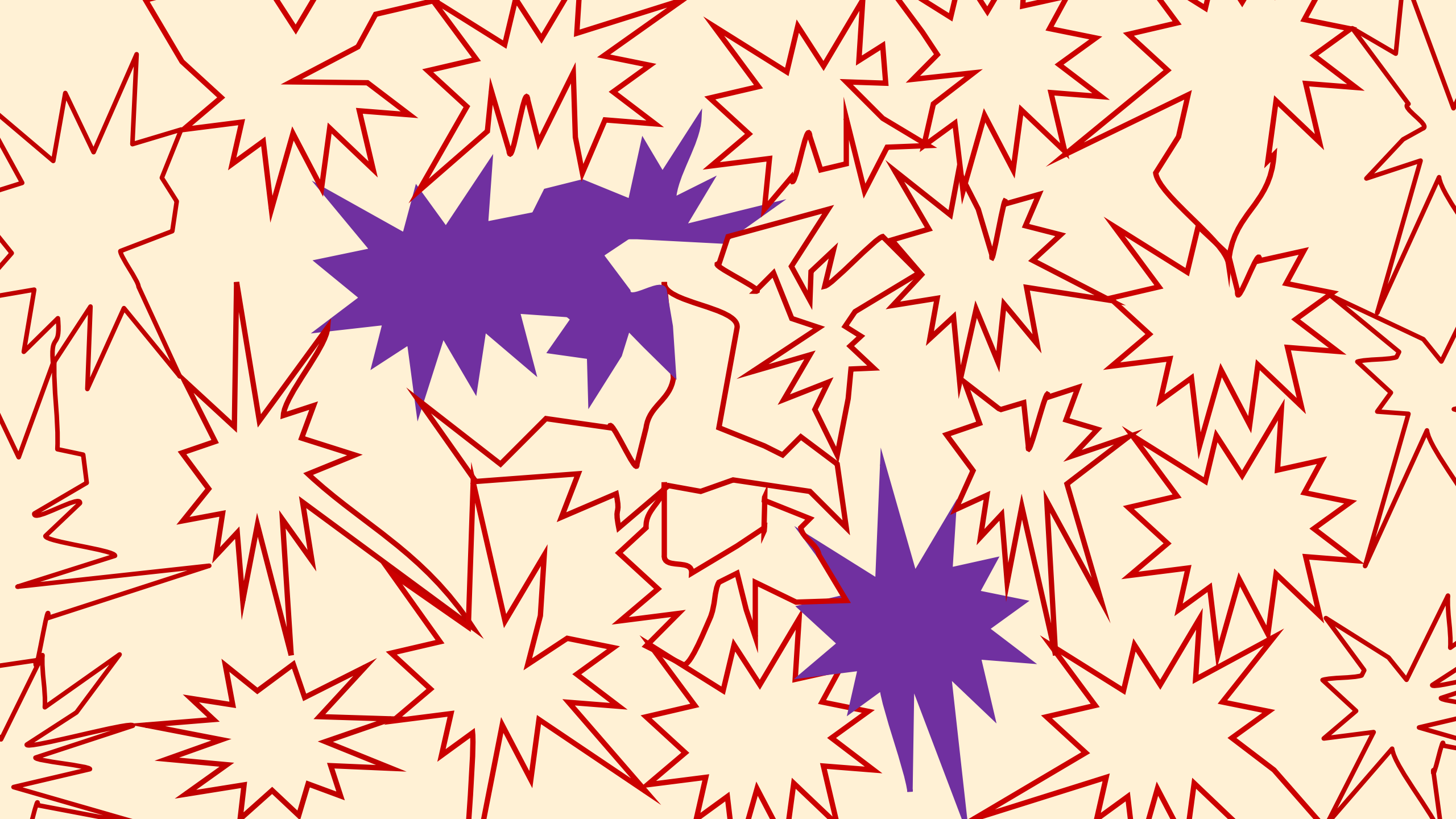


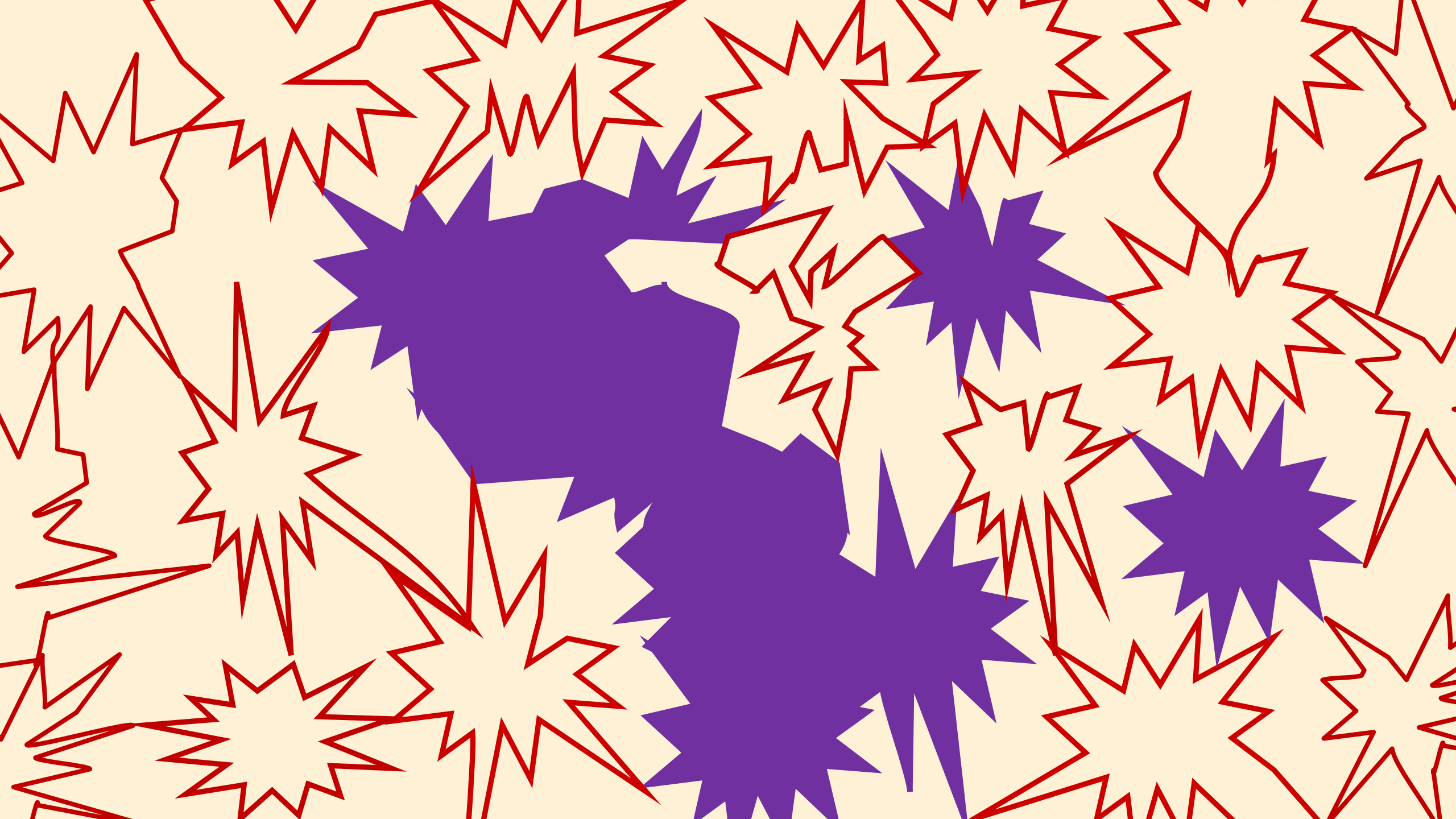
Retiform Purpura











Retiform Purpura

(with necrosis)







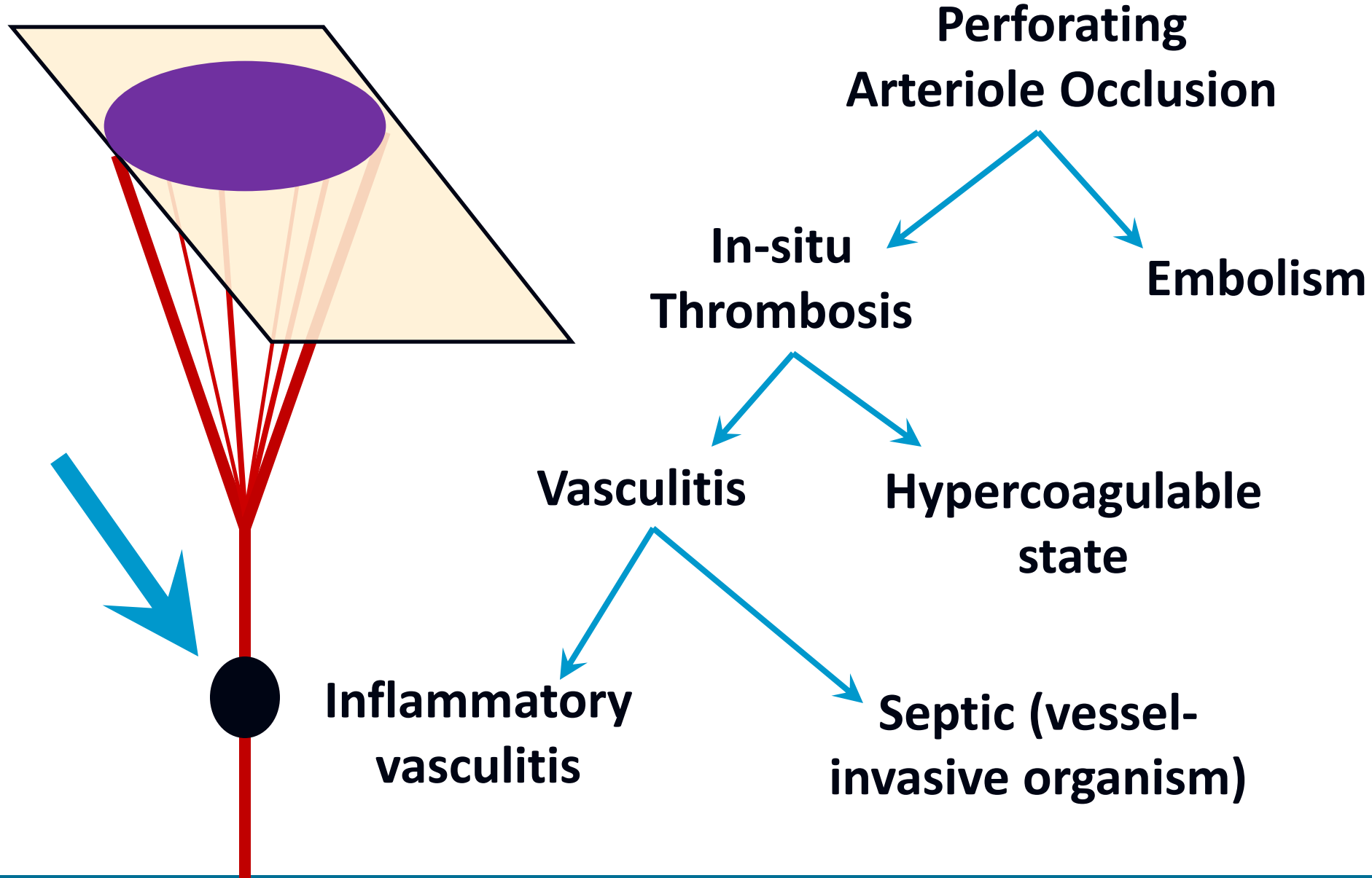


Case Details

- PMH: Systemic lupus, lupus nephritis
- Meds: Mycophenolate mofetil, prednisone
- ED presentation:
 - Vitals: **T104.6, P140s, SBPs 80s**
 - Unresponsive, rash on right leg
- Labs: BASELINES in parentheses after figures
 - **WBC 1.8** (4-9), **HCT 22.7** (24-37), **Plt 76** (150-350)
 - Na 142, K 4.3, Cl 112, HCO3 20, **BUN 79, Creatinine 2.7** (1.2)

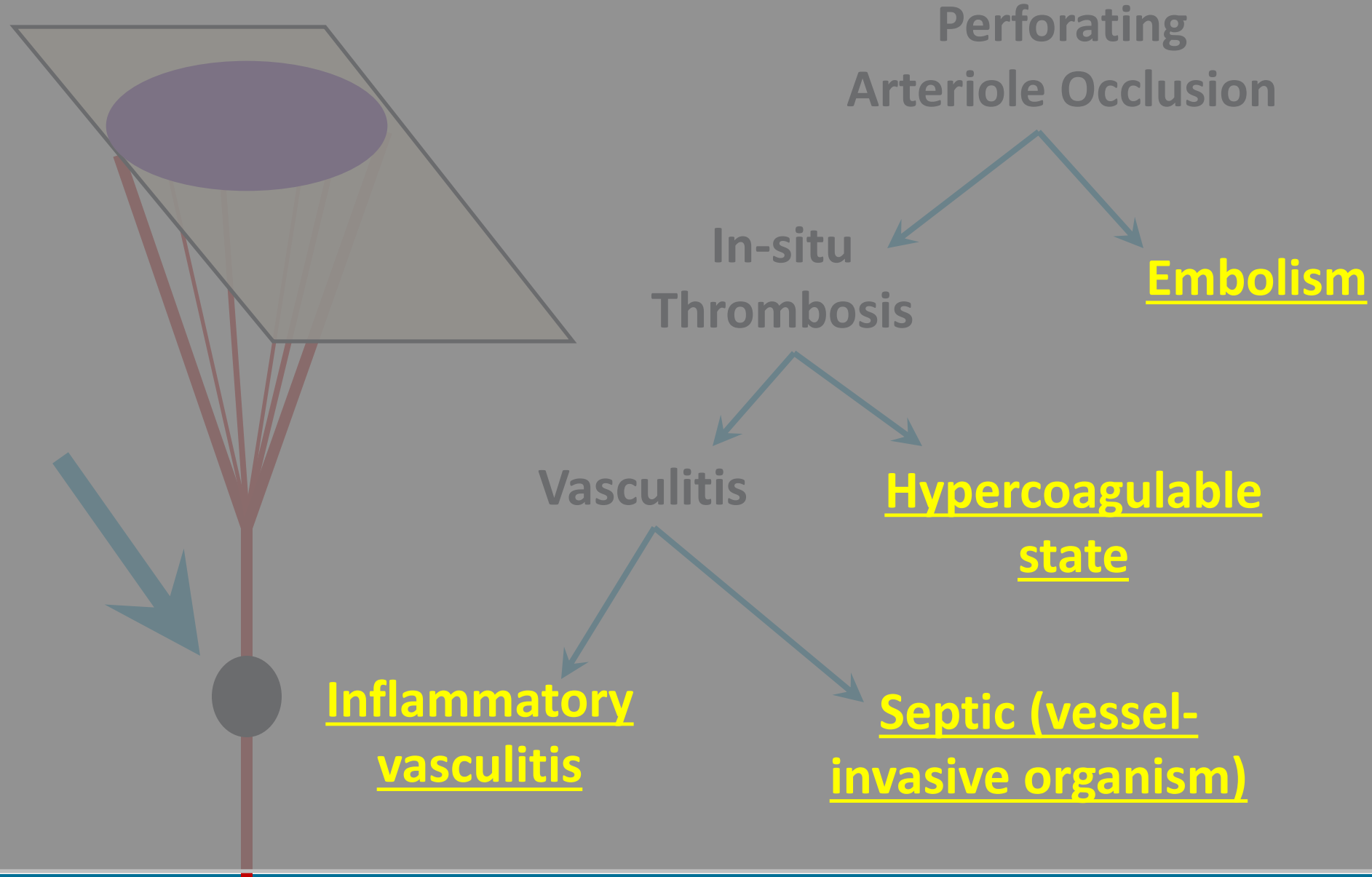
Retiform Purpura:

Differential Diagnosis



Retiform Purpura:

Differential Diagnosis



Retiform Purpura: Select Differential Diagnosis

Emboli	Amniotic Fluid, Atrial Myxoma, Cholesterol, Fat, Nitrogen, Septic, Ventilator Gas
Hypercoagulable States	Amyloidosis, AT III Deficiency, Atrophie Blanche / Livedoid Vasculopathy, APLAS, Calciphylaxis, COVID-19, Cryoglobulinemia, DIC, DVT, Hyperoxaluria, Protein C/S Deficiency, Sneddons Dz, TTP, Xylazine
Inflammatory Vasculitis	Microscopic Polyangiitis, PAN, Rheumatoid Vasculitis, Takayasu's, Wegeners
Septic vasculitis (Angioinvasive pathogens)	GPC: S. aureus GNRs: Aeromonas, E.coli, Klebsiella, Moraxella, Morganella, Pseudomonas, Serratia, Vibrio Fungi: Aspergillus, Candida, Fusarium, Mucor

Please Note:

(Regarding Retiform Purpura)

- **Nothing on the differential is primary cutaneous**
- **Everything on the differential is bad**

Retiform Purpura: Select Differential Diagnosis

Emboli	Amniotic Fluid, Atrial Myxoma, Cholesterol, Fat, Nitrogen, Septic , Ventilator Gas
Hypercoagulable States	Amyloidosis, AT III Deficiency, Atrophie Blanche / Livedoid Vasculopathy, APLAS , Calciphylaxis, COVID-19, Cryoglobulinemia, DIC , DVT, Hyperoxaluria, Protein C/S Deficiency, Sneddon's Dz, TTP , Xylazine
Inflammatory Vasculitis	Microscopic Polyangiitis, PAN, Rheumatoid Vasculitis, Takayasu's, Wegener's
Septic vasculitis (Angioinvasive pathogens)	GPC: S. aureus GNRs: Aeromonas, E.coli, Klebsiella, Moraxella, Morganella, Pseudomonas, Serratia, Vibrio Fungi: Aspergillus, Candida, Fusarium, Mucor

Differential Dx:

- Catastrophic APLAS ("thrombotic storm")**
- Thrombotic thrombocytopenic purpura**
- Systemic infection (Sepsis/DIC, emboli, vascular invasion)**

Dermatologic Workup and Results

- Day 0:
 - Biopsies by derm and surgery
 - Later that night: Blood cultures stain for **GNR in 4/4 bottles**
- Day 1 post admission: Pathology preliminary results—
 - Neutrophilic inflammation in dermis and adipose with hemorrhage.
 - Deep biopsy has sparse GNR on Gram stain
- Day 2: blood and deep biopsy tissue—
 - ***Serratia marcescens***
- Day 3: Abd CT with contrast shows pan-enterocolitis

Diagnosis

Serratia marcescens sepsis with necrotic
retiform purpura of a seeded limb

More faces of Retiform Purpura



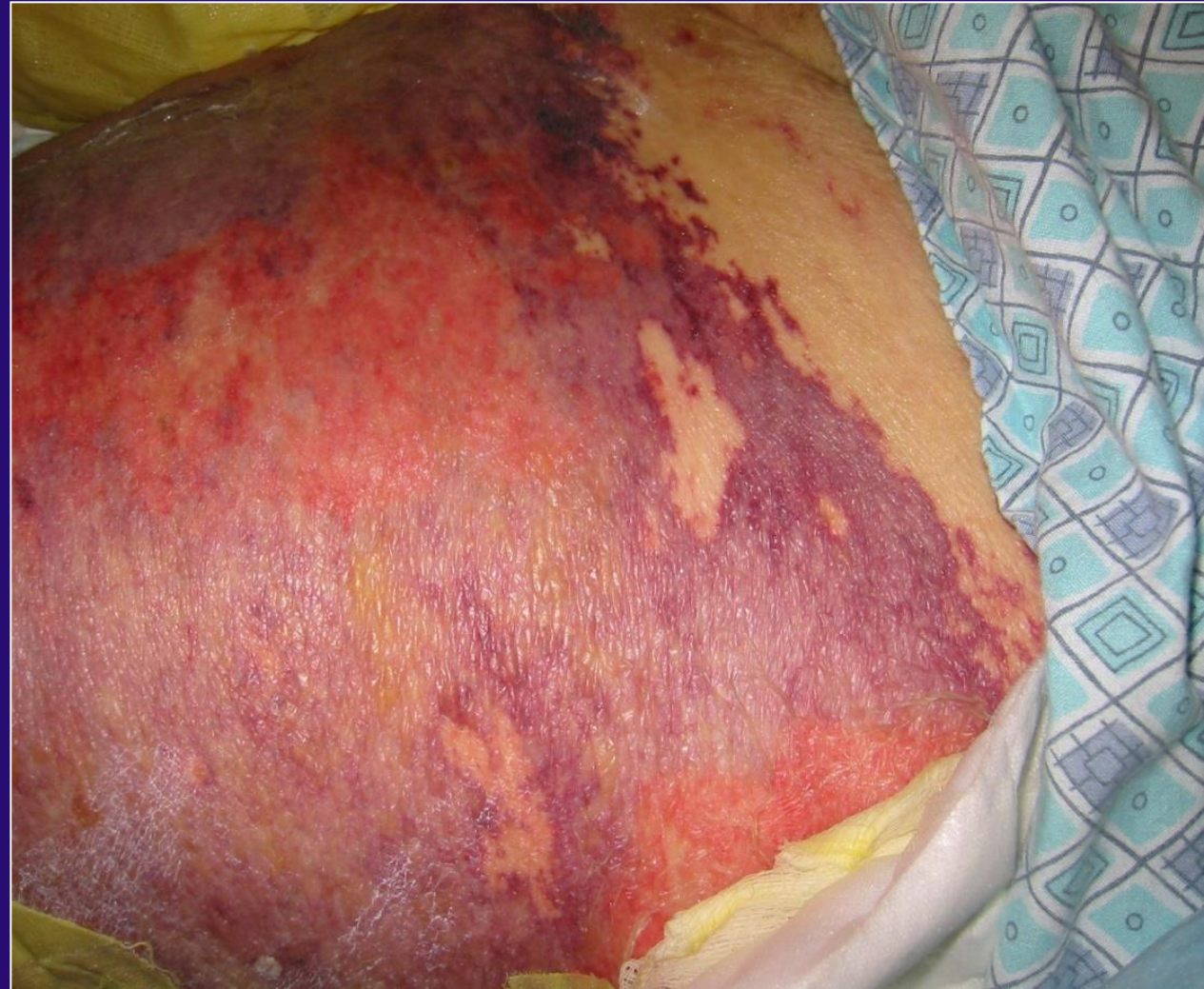
Cholesterol Emboli

Ecthyma Gangrenosum





DIC in sepsis



DIC in sepsis





CASE KEY POINTS

- **Recognize Retiform Purpura:**
 - Well demarcated purpuric patches with jagged edges
 - Violaceous, dusky, white, black
 - Evidence of necrosis (bullae, ulcers, eschars)
- **Early indicator of a systemic, generally malignant process**

Take-Home Points

- Scabies can be missed for months. Maintain a high index of suspicion.
- Cellulitis is tender
- Recognize retiform purpura

Select References

- Moran GJ, Krishnadasan A, Mower WR, Abrahamian FM, LoVecchio F, Steele MT, Rothman RE, Karras DJ, Hoagland R, Pettibone S, Talan DA. Effect of Cephalexin Plus Trimethoprim-Sulfamethoxazole vs Cephalexin Alone on Clinical Cure of Uncomplicated Cellulitis--A Randomized Clinical Trial. *JAMA*. 2017;317(20):2088–2096.
- Pallin DJ, et al. "Clinical Trial: Comparative Effectiveness of Cephalexin Plus Trimethoprim-Sulfamethoxazole Versus Cephalexin Alone for Treatment of Uncomplicated Cellulitis: A Randomized Controlled Trial." *Clin Infect Dis*, 56: 2013 1754-62
- Stevens DL, et al. Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America. *Clinical Infectious Diseases* (Advanced Access June 18, 2014)

Bonus Case

(Time Permitting)

- Healthy 18 year-old male
- 1 day of worsening pruritic rash on face
- ED Diagnosis: impetigo
- Admitted to ED-Observation IV antibiotics
- Next AM: rash extended toward lip and eye
- Derm Consulted















Meanwhile, 40 feet away...





Allergic Contact Dermatitis

(to poison ivy: toxin = urushiol)

- Type IV, T-cell mediated hypersensitivity
- Eczematous reaction pattern
 - Acute: vesicles, erythema, serous fluid
 - Subacute: erosions, erythema, serous fluid
 - Chronic: scaling, lichenification, dyspigmentation
- Other important physical exam features
 - Symptoms: Pruritic, non-tender
 - Lines/ geometric shapes







