



***Rash and
infection***



Objectives

- To understand the different types of organisms that can cause skin pathology
- To appreciate the common clinical presentations
- To understand the important investigations
- To briefly appreciate the ways in which infections and infestations are treated

Infectious diseases with rash

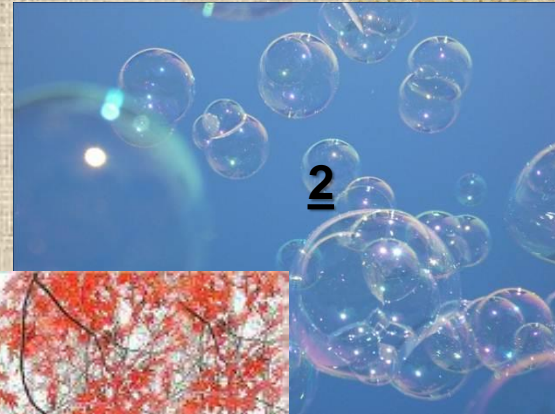
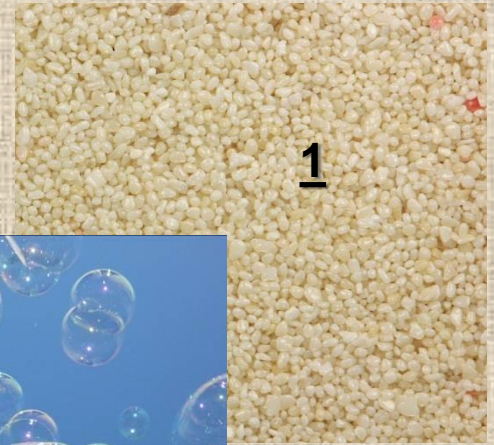
- Measles
- Scarlet fever
- Rubella (German measles)
- Smallpox
- Chicken pox
- Meningococcal infection
- Herpetic infection
- HIV infection
- Enteroviral infection
- Rickettsiosis

Infectious diseases with rash

- Hemorrhagic fevers
- Typhoid fever
- Paratyphoid fevers A, B
- Generalized salmonellosis
- Infectious mononucleosis
- Yersiniosis
- Leptospirosis
- Trichinelosis
- Tularemia
- Anthrax

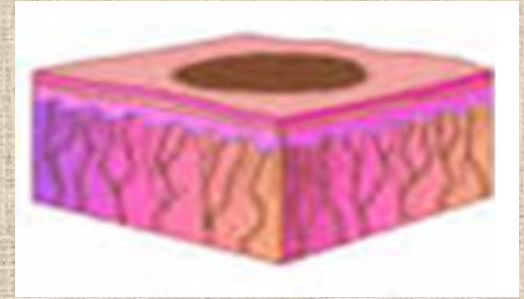
Classification of the rashes according to the morphology:

1. maculopapular
2. vesiculobullous
3. petechial or purpuric
4. erythematous
5. nodular

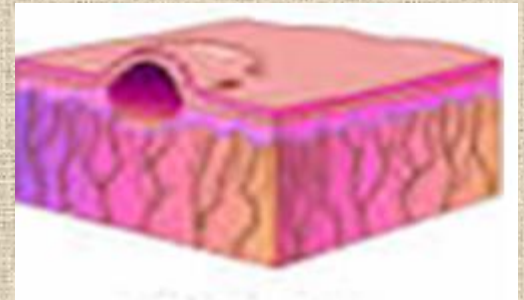


Name the types of skin rash:

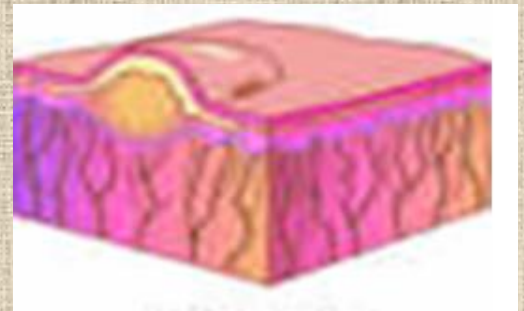
1



2



3



Types of skin rash

macula:

- small (< 1cm) skin discoloration
- in the level of the skin

patch:

- macule that exceeds 1cm in size

papula:

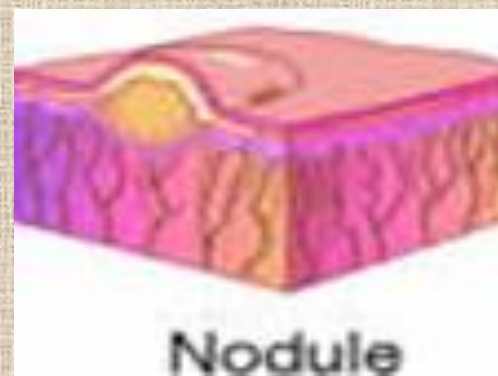
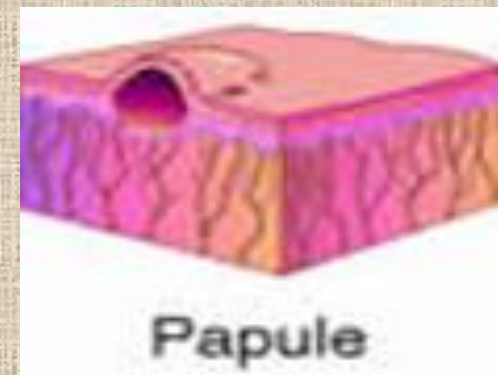
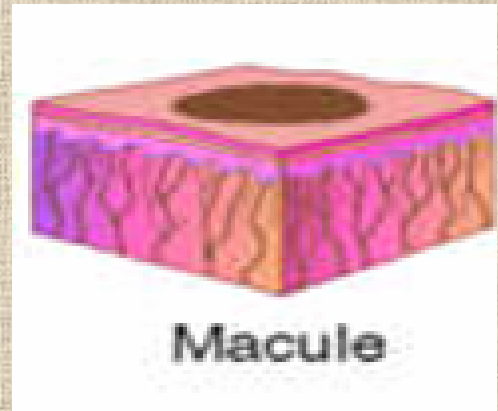
- small (<0,5-1cm) palpable
- raised, solid, flat skin spot

plaque

- papula >0,5-1cm in size

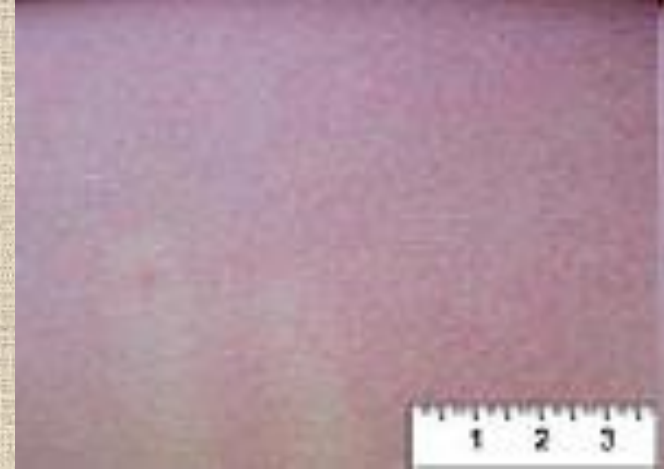
nodule

- similar to papule but located deeper in the dermis or subcutaneous
- may be above, in the level, or below the skin surface



Maculopapular rash :

⇒ **Scarlatiniform rash (<1 mm)**



⇒ **Rubelliform rash (1-3 mm)
pale, separated**



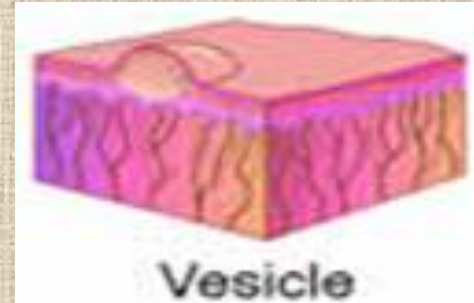
⇒ **Morbilliform rash (measles-
like)(3-5 mm), can be confluent**



Types of skin rash

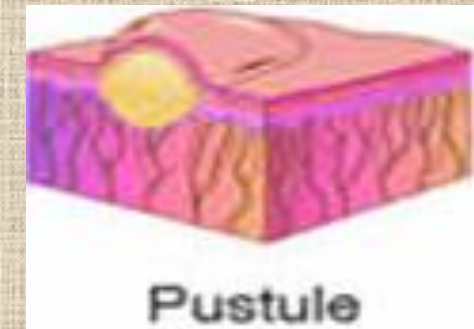
vesicle (blister)

- small (< 0.5cm) circumscribed
- fluid-filled elevation within the upper skin layer
- has a thin wall, and is often translucent



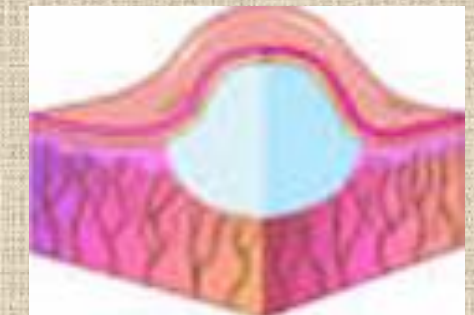
pustula

- pus-filled vesicle



bullae

- vesicle that exceeds 0.5 cm in size



- 1. Type**
- 2. When**
- 3. Where**
- 4. Evolution**
- 5. Prurit**
- 6. Travel / drugs / pts medical history?**

GENERALISED MACULOPAPULAR RASH IN CHILDREN 3-14 YO

Scarlet fever *Str. pyogen* β -hemol.:

- Fever + toxic syndrome
- **Exudative pharyngitis**
- Rash: 12-48 h, periauric → 24 h down; pinpoint papules
- Avoid face, palms, soles. > skin folds; confluent,

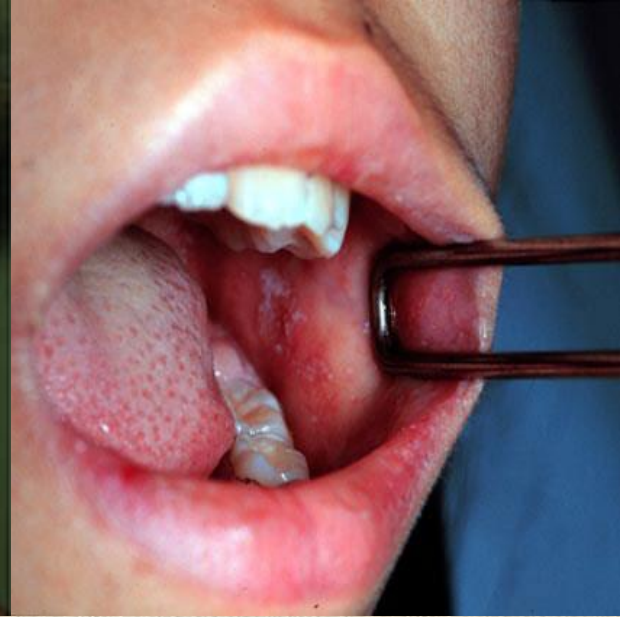
Measles:

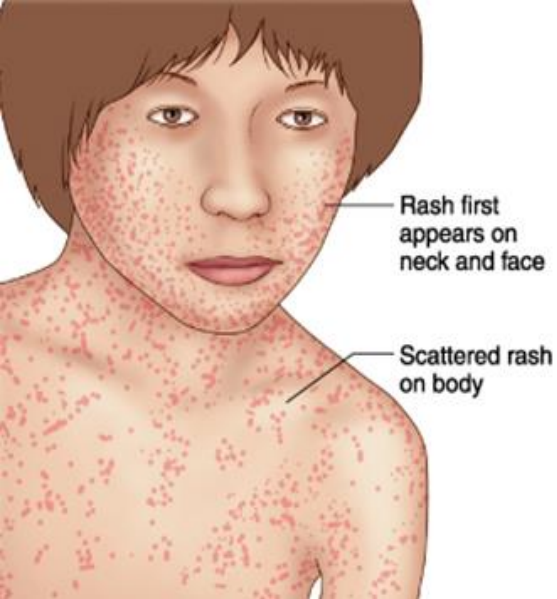
- Fever + toxic + **catarrhal syndr.:** conjunct., cough, coryza
- Koplik spots = 2-5 d white lesions on oral mucosa
- Rash: 3-4 d; spread up → down in 3 d; confluent;

German measles

- Low-grade fever
- L.adeno: occipital, post-auricular, post-cervical
- Rash: 1-3 day, discrete, face+neck → trunk & extremities
- as it spreads, it clears on the face







MACULOPAPULAR RASH IN A 'GLOVE-AND-SOCKS' DISTRIBUTION

Yersinia pseudotuberculosis

Fever, toxic syndr.

Rash: 2-6 d; joints, trunk, „hood“, „gloves“, „socks“, generalized
gener. mycro-poly-lymphaden. (~ pseudoappendicitis)

Hepato-splenomegalia,

Enterocolitis

~ arthritis large joints

↑ WBC (left), ↑ AIAt

Papular-purpuric gloves and socks syndrome (PPGSS) parvovirus B19 infection

Children, > spring & summer

Rash: **before low-grade fever** (2-4 d), ~ petechial / purpuric, ~ **pruritus**,
oral mucosal erosions (hard, soft palate, pharynx, tongue, inner lips)
arthralgias & lymphadenopathy.

↓RBC, ↓ WBC, ↑ eosin., ↓ thrombo, ↑ AIAt

Kawasaki disease (autoimm. medium+small sized blood vessels, necrotizing arteritis)

children <5 yo, Asian descent, pre-existing viral inf.

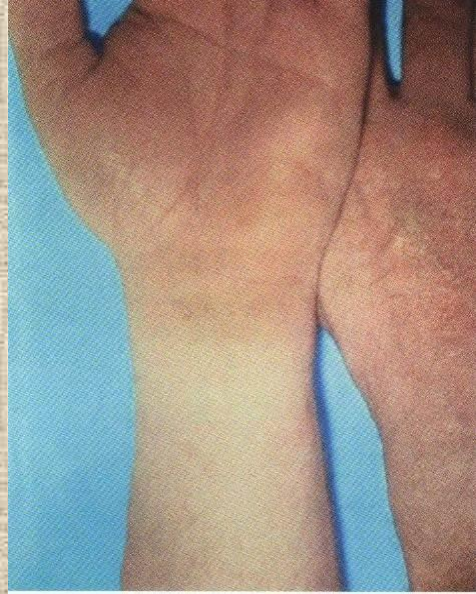
fever 39-40°C

Rash: „gloves“, „socks“, ~ trunk, face, extremities, perineum

conjunctivitis, gingivitis, strawberry tongue, cervical lymphaden.

myocarditis & aneurysm coronary arteries, ~ pericarditis, valvulitis,

~ arthritis, diarrhea, meningitis, pneumonitis, hepatitis





Generalised maculopapular rash

Rickettsiosis

geographic; tic/flea bite, louse

fever, flu-like

Rash: 3-5 day, ~ eschar at the inoculum site

hepatospleno

Drug eruption

suddenly, often with fever,

Rash: 7-10 days after the drug is first taken, often pruritic

~ polyorganic involvement

Syphilis

chancre history 4-10 week prior

low fever, sore throat, malaise, weight loss, patchy alopecia

Rash: trunk, extremities, +palms, +soles

general. lymphaden, ~ organ involvement: liver, renal, CNS, ocular

HIV

Group of risk

Momo-like syndrom; ~ opportun infection

Scarlet fever *Str. pyogen* β -hemol.

Yersinia pseudotuberculosis

Children 3–12 years

Children - **adults**

Fever, **chills**, toxic syndr.

Fever, toxic syndr.

Rash:

- **12-48 hours** after onset
- lasts ≥ 1 week.
- periauric. > **in 24 h.** > down
- lobster skin
- **avoid face, palms, soles**
- Pastia = petech. major skin folds
- spare nasolabial Δ
- strawberry tongue 4-5 days
- desquamation fingers, toes 5-10d

Rash:

- **2-6 days** after onset
- lasts $\leq 3-7$ days
- **simultan. joints, trunk,**
- **face / neck hyperemia**
- **„hood”, „socks”, „mitten”**
- —"—
- —"—
- —"—
- —"—

- **exudative pharyngitis**
- regional lymphadeno

- **gener. mycro-poly-lymphadeno.**
- **hepato-splenomegalia, ~jaundice**
- **mycro-poly-lymphadeno.**
- **pseudoappendicitis**
- **dispeptic (~enterocolitis)**
- **reactive arthritis, large joints**
- **~eritema nodosum**

Penicillini, amoxicillini, erzthromycini,
cefalosporins I (cephalexini)

Cefalospor III, fluorquinolons



Describe the rash...

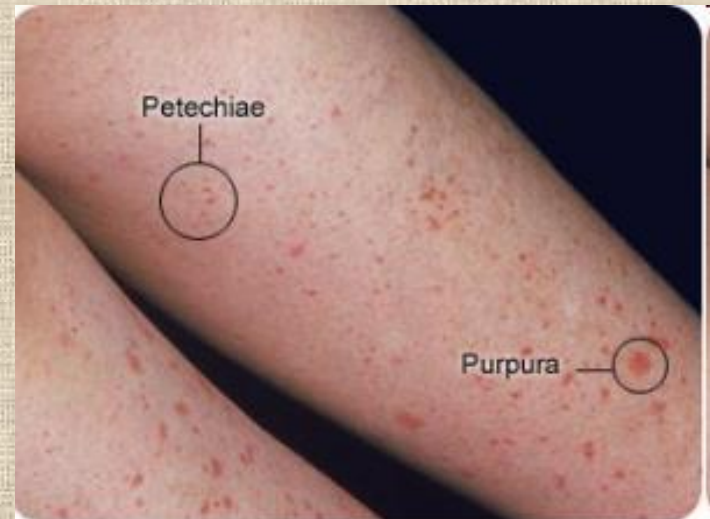
Hemorrhagic rash

Erythematous (reddish) skin lesions resulting from the extravasation of blood due to intradermal capillary leakage.

- **Petechiae:** <3 mm, nonblanching
- **Purpura:** 0.3–1cm may be raised
- **Ecchymoses** >1cm



Petechiae evident on the soft palate



Purpura → abnormalities in any of the three components of hemostasis :

1. ***vascular wall,***
2. ***platelets,***
3. ***coagulation cascade***

The purpuras - conveniently divided into:

- **palpable**
 - vasculitic and/or inflammatory damage:
 - extravascular fibrin deposition
 - cellular infiltration in inflammatory disorders
 - cellular infiltration in malignant disorders
- **nonpalpable macular purpura**
 - hemostatic disorders
 - vascular damage
 - vasculitic / inflammatory damage

Thrombocytopenia & pigmented purpuric dermatoses, are not usually palpable.

PATHOPHYSIOLOGIC CAUSES OF PETECHIAL AND PURPURIC LESIONS

THROMBOCYTOPENIA

Bleeding occurs at platelets <50,000

>> Increased destruction

Idiopathic Thrombocytopenia Purpura, neonatal autoimmune thrombocytopenia, Thrombotic thrombocytopenic purpura, Evan Syndrome

>> Decreased production (marrow infiltrative processes and bone marrow suppression)

Malignancy (leukemia, lymphoma, neuroblastoma), aplastic anemia, drug-induced, storage diseases, radiation therapy, Thrombocytopenia-absent radius syndrome, congenital amegakaryocytic thrombocytopenia, Fanconi anemia, **EBV, CMV, HIV, varicella, mumps, TORCH, lympho-proliferative disorders**

>> Sequestration

Splenomegaly, chronic liver disease, portal vein thrombosis, Kasabach-Merritt syndr.

PLATELET DYSFUNCTION

>> Congenital

>> Acquired

Drug or **toxin-induced** (aspirin, non-steroidals, lasix, heparin)

COAGULATION DEFICIENCIES

>> Congenital

>> Acquired

Liver disease, uremia, vitamin K deficiency

LOSS OF VASCULAR INTEGRITY

>> Trauma

>> Increased venous pressure

>> Disorders of collagen synthesis

>> Vitamin C deficiency

>> **Vasculitis**

>> **Toxins**

Infections → MULTIFACTORIAL

GENERALIZED MACULOPAPULAR RASH → HEMORRHAGIC

Rocky Mountain spotted fever

- **geographic region, tick** bite 2-14 d prior,
- Fever, flu-like sympt.
- Rash: 2-5 days after fever >> maculopapular generalized, **spreads centrally**, +petehial, +hands, +soles, **+face**
- rickettsia >> endotheliotropism

Ebola, Marburg, Dengue hemorrhagic fever

- **geographic region,**
- high fever,
- flu-like sympt., joint pain, dispeptic
- **Rash: 3-6 days diffusely**
- minor hemorrhagic: petechiae, epistaxis, gingival

HEMORRHAGIC RASH

Meningococemia

Sudden, fever, toxic

Rash: 1-2 day, buttocks → legs → generalized

+ ~ meningitis

Endocarditis

Sudden / gradually, longer duration fever prior to presentation

Rash: finger, toe, palms, soles, legs, ~thorax

change heart murmur 90%

hematuria 60-70%, septic embolia 15%

Vasculitis small vessels (leukocytoclastic)

infection / medication,

fever less common

Rash: palpable purpuric rash, lower , ~upper extremities, simetric

Henoch-Schönlein purpura (American College of Rheumatology):

patient <20 yo at onset,

palpable purpura, simetric, lower extrem

bowel angina (diffuse abdominal pain)

acute arthritis in any joint (> ankles, knee)

renal involvement (hematuria and/or proteinuria).

HEMORRHAGIC RASH

HUS - Hemolytic uremic syndrome (endothelial injury by **toxins shiga /shiga-like toxin**)

platelet sequestration, destruction, consumption in micro thrombi
microangiopathic hemolytic anemia (fibrin / red cell rich thrombi)

Infants, young children, may at any age

antecedent history **diarrheal illness** *E.coli* O 157; *Shigella dysent.*

severe renal insuf.; uremia

usually no pancreas, adrenal, brain, heart involvement

Thrombotic thrombocytopenic purpura (TTP) clotting in vessels

microangiopathic hemolytic anemia

neurologic abnormalities (hallucin., altered mental status, stroke)

fever 50%,

renal disease,

Organomegaly → not typical

Idiopathic Thrombocytopenia Purpura (autoimmune)

Chronic adults (>wo), acute **children** (viral inf. 50%, parvovirus)

Splenomegaly excludes ITP

Normal bone marrow

CASE 10 yo girl

- ill for 2 days
- high fever, intoxication, vomiting
- petechial rash since 24h extremities, trunk, face
- hipotension



CASE 27 yo man

- high fever, intoxication
- petechiae conjunctival, hands, feet, subungual hemorrhages
- systolic murmur at the cardiac apex
- tender hepatomegaly



CASE 46 yo man

- Ill for 2 we, no fever
- palpable purpura rash over lower extremities
- Chronic VHC hepatitis



Subconjunctival haemorrhages
(2-5%)



Cerebral emboli
(15%)

Roth's spots in fundi
(rare, < 5%)

Petechial haemorrhages on mucous membranes and fundi
(20-30%)

Poor dentition

Splenomegaly
(30-40%, long-standing endocarditis only)

Systemic emboli
(7%)
Nail-fold infarct



Digital clubbing
(10%, long-standing endocarditis only)

Splinter haemorrhages
(10%)



'Varying' murmurs
(90% new or changed murmur)

Conduction disorder
(10-20%)

Cardiac failure
(40-50%)

Haematuria
(60-70%)

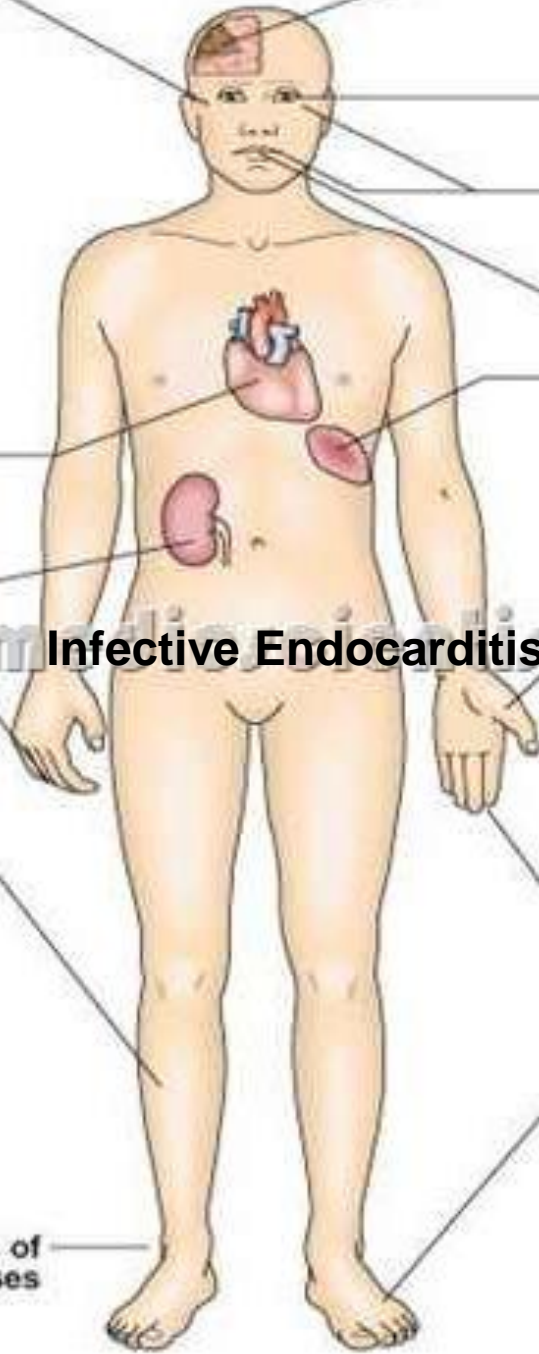
Osler's nodes
(5%)

Petechial rash
(40-50%, may be transient)



Loss of pulses

Infective Endocarditis



✓ Vesicles - small, clear, fluid-filled blisters < 10 mm in diameter.



	SMALLPOX	CHICKENPOX
FEVER	2 to 4 days before rash	At time of rash
RASH		
• <i>Appearance</i>	Pocks in same stage	Pocks in several stages
• <i>Development</i>	Slow	Rapid
• <i>Distribution</i>	More pocks on arms and legs	More pocks on body
• <i>On palms and soles</i>	Usually present	Usually absent
DEATH	Usually 1 in 10 die	Very uncommon



Smallpox



3



5



7

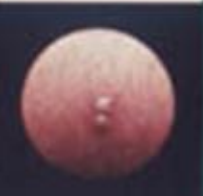


10

3



5



7



10



Chickenpox



HSV

- Clustre of tense vesicles on an erythematous base.
- Vesicles contain a clear to yellow fluid.
- After initial infection HSV → latent in sensory nerve cell bodies, life-long.

HIV:

HSV infection:

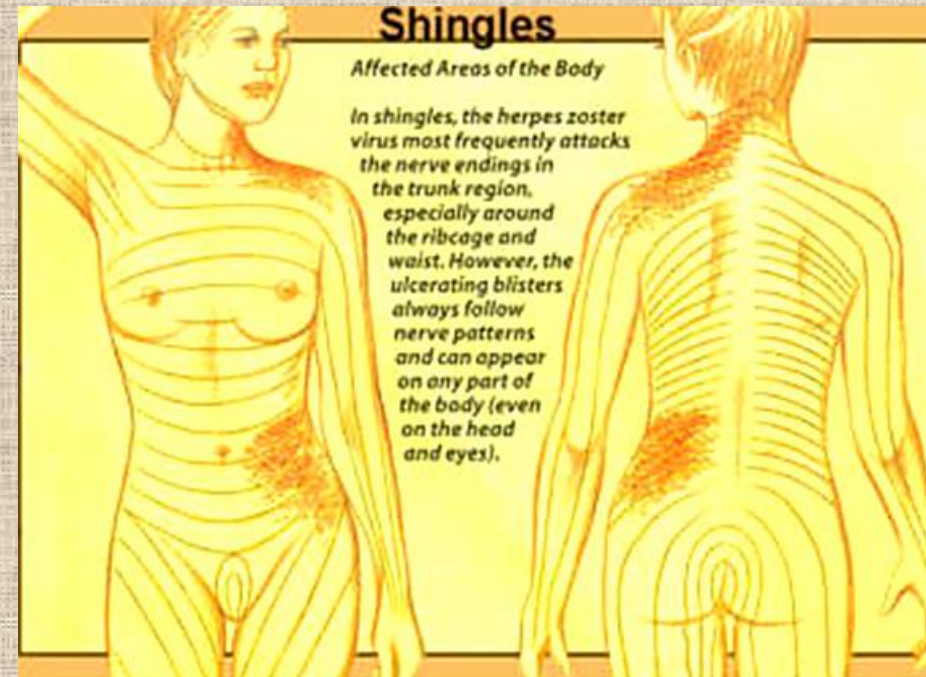
- chronic >1 mo duration
- orolabial / genital / anorectal
- visceral at any site

HZV infection:

- children / young adults
- bilateral / multidermatomal
- repeated / recidivant

HZV (Shingles)

- Reactivation of chicken pox
- When immunity breaks down
- Fever, chills, fatigue, headache
- severe pain, itching, tingling, burning, redness



Vesicular



Hand, Foot And Mouth Disease

(enterovirus Coxsackievirus A16)

- Children < 10 years old
- Fever, sore throat, painful sores in mouth
- Skin rash: vesicular, not itchy
 - palms, hands, soles
- DD. allergic, HSV, chickenpox



Vesicular

© 2007 Logical Images, Inc.

© 2007 Logical Images, Inc.

© 2007 Logical Images, Inc.



	Cellulitis	Erysipelas	Impetigo
Infection of	skin and cutaneous connective tissue.	more superficial than cellulitis	superficial infection of the skin
	borders are poorly defined Erythema: swollen tender, warm pus blisters	borders are well defined & raised Erythema: superficial, hot, shiny, painful, serous blisters, bullae	→ non- bullous form with yellow crusty erythematous patches → bullous form with erythema and blisters
Fever, intoxication	+++	++ often precede skin lesion	
common sites	abdomen, lower legs	face, limbs	face, limbs
Pts	underlying diseases: diabetes, venous insufficiency, obesity, imm/deficiency		children
Common agent	Streptococcus, Staphylococcus	group A beta-haemolytic streptococci	Staphylococcus, Streptococcus

Signs	Pseudotuberculosis	Meningococemia	Chickenpox
<i>Initial symptoms</i>	acutely with many symptoms (intoxication, intestinal changes, seldom - catarrhal signs)	intoxication, develops very acutely, initial measles-like rash	Acutely, observing catarrh, intoxication, rash
<i>Time of the rashes' beginning</i>	on 2-8 day	first hours of the disease	On 1-2 days, appear next 3-5 days as pushes
<i>Morphology</i>	puncture-like, small spots, erythema	hemorrhagic "star-like" with necrosis in the centre	Polymorphic (spots, papules, vesicles, crusts)
<i>Sizes of elements</i>	Small, middle, large	from small to significant	middle
<i>Localization</i>	"hood", "mitten", "socks" signs, in skin folds, bends, around joints	buttocks, lower limbs, less - on trunk, hands, face	On whole body, on hair part of the head, seldom - on palms and soles
<i>Brightness and color of elements</i>	bright	hemorrhagic, bright, sometimes cyanotic	Papules are pink, vesicles - on hyperemied base
<i>Further rashes' development</i>	gradually disappear for 2-5 days, small, lamellar shelling	Small, disappear gradually, significant, leave "dry" necrosis	After desquamation of the crusts - a slight pigmentation
<i>Catarrhal phenomena</i>	Not typical	are absent, in 30-40% on previous 2-3 days - nasopharyngitis	Moderate,
<i>Oral mucous membranes</i>	Possible hyperemia of the pharynx, tonsils,	hyperemia and groininess of back pharyngeal wall, hypertrophy of follicles	On pink background - polymorphic elements
<i>Intoxication</i>	expressed, long-lasting (2-3 weeks)	sharply expressed	Small or moderate
<i>Other symptoms</i>	arthritis, myocarditis, diarrhea, hepatitis, abdominal syndrome, lymphoproliferative symptom, kidneys, nervous system damage, pneumonia	meningitis, encephalitis, arthritis, iridocyclitis, endocarditis, aortitis, pneumonia, pleurisy	Seldom: generalized visceral forms, meningoencephalitis
<i>Laboratory criteria</i>	leucocytosis, shift to the left, high ESR, Indirect hemagglutination reaction with special diagnostic test (+), separation of Y. pseudotuberculosis from excrements	leucocytosis, shift to the left, neutrophyllosis, high ESR, in nasopharyngeal swab, thick drop of blood - meningococci	Leucopenia, lymphocytosis, serological: binding complement reaction with Chickenpox antigen (+)

Signs	Measles	Rubella	Scarlet fever
<i>Initial symptoms</i>	catarrhal signs from upper airways, conjunctives during 2-4 days, intoxication	Increase of occipital lymph nodes, small catarrhal signs and intoxication	Acutely - intoxication, angina, regional lymphadenitis
<i>Time of the rashes' beginning</i>	on 4-5 days of the disease, with stages	1 day, seldom 2	1 day (in 20% - 2)
<i>Morphology</i>	maculopapulous	small-papulous,	small point-like
<i>Sizes of elements</i>	middle, large	small, middle	small
<i>Localization</i>	1 day - on the face 2 - on the face, trunk; 3 - on the face, trunk, limbs	on whole body, mainly on unbending surfaces of the limbs	mainly on bending surfaces of limbs, down the abdomen, lumbar region, face, lateral surfaces of the trunk, pale nose-labial triangle
<i>Brightness and color of elements</i>	bright red	pale-rose	bright
<i>Further rashes' development</i>	pigmentation, slight hulling	disappear on 3-4 days	gradually turn pale for 4-5 days, small, lamellar hulling
<i>Catarrhal phenomena</i>	expressed in first 5-6 days	small, short for 1-2 days	Not typical,
<i>Oral mucous membranes</i>	hyperemied, friable, enanthema, Koplick's spots	clear, sometimes single elements of enanthema	marked off, bright hyperemia, enanthema on palate, angina
<i>Intoxication</i>	significant, lasts 5-7 days	small or being absent	proportional to local signs, short for 1-3 days
<i>Other symptoms</i>	Complications (respiratory, digestive, nervous, urinary systems, eye, ears, skin)	increased and painful posterior neck and occipital lymph nodes	angina, changes on the tongue (raid, from 4-5 days "strawberry"), complications on 2-3 weeks
<i>Laboratory criteria</i>	leucopenia, lymphocytosis, aneosynophylia, serological reaction with measles antigen (+)	leucopenia, lymphocytosis, increase of the plasmatic cells' number, serological reactions with rubella antigen (+)	leucocytosis, shift to the left, neutrophyllosis, enlarged ESR, in pharyngeal, nasal swabs - streptococci

Sign	Pseudotuberculosis	Scarlet fever	Infectious mononucleosis	Typhoid fever	Enterovirus infection	Viral hepatitis
Beginning	Acute	Acute	Acute	Acute	Acute	Acute, subacute
Initial signs	Toxic, dyspeptic and different other signs	Sore throat, toxic	Lymphoproliferative, toxic	Toxic	Catarrhal, toxic	Catarrhal, dyspeptic, arthralgic, asthenic
Rashes	Pin-point, maculopapulous, erythema	Pin-point, sand paper	maculopapulous, erythema	Single reseals	Small maculous	Rare (in case of B hepatitis)
Catarrhal sign	Typical	Absent	Absent	Rare	Typical	In the initial period
Changes in the throat	Hyperemia of the back pharyngeal wall	Tonsillitis	Tonsillitis Hyperemia of the back pharyngeal wall, posterior rhinitis	Hyperemia of the palatal arch, back pharyngeal wall	Herpangina	Absent
Joints' damage	Arthritis, arthralgias	Not typical	Absent	Absent	Absent	Arthralgias in the initial period
Abdominal pain	Around the navel	Absent	Absent	In the right inguinal region	Around the navel	In the right hypochondria
Dyspeptic syndrome	Typical	Rare	Absent	Constipation, rare - diarrhea	Typical	More intensive in prodromal period
Hepatitis Л	May be	Absent	May be	Absent	Absent	Typical
Lymphoproliferative	May be	Regional lymphadenitis	Typical	Hepato- and splenomegaly	Absent	Hepato-, rare - splenomegaly
Tongue	Coated, strawberry from the 4th-5th day	Coated, strawberry from the 4th-5th day	Coated	Coated with grey, teeth excavation on its' borders	Coated	Coated
Damage of the nervous system	May be	Not typical	Not typical	Delirium, sopor	May be serous meningitis, encephalitis (rare)	Hepatic encephalopathy in severe case

Disease	Incubation/presenting symptoms	Morphology	Distribution of rash	Associated findings	Laboratory finding
Chikungunya fever	3-12 days, fever, arthralgia, myalgia, headache ± vomiting	Flushing erythema	Face, upper chest	Severe joint pains, conjunctival injection	Normal CBC, raised ESR, raised C-reactive protein, Chikungunya IgM positive
Scarlet fever	2-4 days, fever, pharyngitis ± vomiting, abdominal pain, ± convulsions	Pinpoint papules on an erythematous background (sand paper), linear petechiae (pastia's lines), membranous desquamation of palms/soles	Generalized, spares palms and soles	Exudative pharyngitis	ASO titer positive, leucocytosis, raised ESR
Kawasaki disease	High fever, irritability	Flushing macular erythema, non pruritic erythematous plaques, erythema marginatum, desquamation of palms/soles	Most prominent on trunk and extremities	Conjunctivitis, strawberry tongue, coronary artery aneurysms, lymphadenopathy	Leucocytosis, raised ESR, thrombocytosis during second to third week, sterile pyuria in the 1st wk
Toxic shock syndrome	Sudden onset fever	Erythroderma or scarlatiniform rash	Generalized	Hypotension, renal involvement, focus of infection	Raised serum creatinine phosphokinase level
Erythema infectiosum (fifth disease Parvovirus B-19)	6 days, nonspecific fever and malaise	Macular erythema on face (1-4 days)	Slapped cheek appearance of face followed by extremities, lacy rash over extensor surfaces	Aplastic crisis in sickle cell disease, women may develop arthritis, spontaneous abortions	IgM anti-bodies positive

Disease	Incubation/presenting symptoms	Morphology	Distribution of rash	Associated findings	Laboratory findings
Measles	8-12 days, rhinitis, cough, fever	Erythematous macules and papules, later becomes confluent	Begins on neck and face, spreads down and become generalized and as it fades it leaves a brownish hue with fine desquamation	Koplik's spots, exudative conjunctivitis, photophobia, pneumonia	Leucopenia, low ESR, IgM positive (measles, immunoglobulin)
German measles (Rubella)	14-23 days, mild URI, fever, eye pain, lymphadenopathy	Pinpoint maculopapular rash	Begins on face and spreads to trunk and extremities	Tender cervical lymphadenopathy, transient polyarthralgia and polyarthritis irritability, febrile seizures	Nasal culture for virus antibody titers
Roseola (Exanthem subitum HHV-6)	5-15 days, high fever for 3-5 days, diarrhea, cough	Pale pink macules and papules	Trunk, neck and proximal extremities		Leucocytosis at the onset and leucopenia later
Infectious mononucleosis	Fever, malaise	Polymorphic macular erythema ± petechiae, urticaria, erythema multiforme like lesions	Generalized	Pharyngitis, lymphadenopathy, pinhead petechiae at the junction of soft and hard palate (Forschheimer's spots)	Leukocytosis, atypical lymphocytes LFT (transaminases and bilirubin) may be elevated, serology for heterophilic antibodies positive
Secondary syphilis	Fever, headache, pharyngitis	Polymorphic macules/papules/poriasiform papules	Generalized	Lymphadenopathy ± condyloma lata ± moth eaten alopecia	VDRL positive

Typhoid fever	Fever, vomiting, diarrhea, headache	2-3 mm pink grouped papules (Rose spots) generalized erythema “erythema typhosum”	Generalized, trunk		Rose spot cultures may be Salmonella typhi positive
Chikungunya fever	3-12 days, fever, arthralgia, myalgia, headache, vomiting	Flushing erythema maculopapular lesions, ± petechiae	Trunk and extremities	Severe joint pains, conjunctival injection	Normal CBC, raised ESR, raised C-reactive protein, Chikungunya IgM positive
Lepto-spirosis	Acute phase: Fever, headache, myalgia, pharyngitis	Morbilliform rash	Generalized	Immune phase: hemorrhage, jaundice, organ failure	Leukocytosis, microscopic agglutination test is positive
Acute retroviral syndrome (HIV)	Fever, fatigue headache	Maculopapular rash	Trunk and upper arms ± palms and soles	Myalgia, lymphadenopathy	HIV RNA, P24 antigen
Rocky mountain spotted fever	3-12 days, fever, malaise, headache	Erythematous macules, evolves to petechiae and purpura	Begins on wrist, ankles; spreads centrally; seen on palms and soles	Hepatosplenomegaly, hyponatremia, myalgias, CNS involvement	Rickettsial group specific serologic tests positive
Drug exanthem	4-6 days, fever, malaise	Maculopapular or urticarial	Generalized symmetric often spares the face, palms and soles may be involved	Periorbital edema, fever	ESR is low