Designing & Evaluating Clinical Algorithms for STI Case Management

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RHR/STI

Session outline

- STI case management

- STI syndromic case management

- Algorithms development

- Implementation

- Algorithms evaluation

- Exercise (Group + presentation)

Objectives of an STI programme

- to interrupt the transmission of sexually transmitted infections

- to prevent development of disease, complications and sequelae

- to reduce the risk of HIV infection

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Objectives of STI case management

- to provide appropriate antimicrobial therapy in order to:
  - obtain cure of infection
  - decrease infectiousness
- to limit or prevent high risk behaviour
- to ensure that sexual partners are treated in order to interrupt the chain of transmission

STI case management: Requirements

- **Accurate diagnosis**
- **Treat at first encounter**
- **Rapid cure with effective drugs**
- **Simplicity**

- **Integrated approach**
- **Condom promotion**
- **Education/Counselling**
- **Partner notification**

Comprehensive STI case management

- History taking (symptoms)
- Examination (signs)
- Treatment
  - Client and sexual partner(s)
- Counselling for STIs and PITC for HIV (provider initiated testing and counselling for HIV)
- Condom promotion

Factors that influence patients' choice of facility

- **Accessibility**
  - **proximity**
  - **affordability**
- **Acceptability**
  - **non-stigmatising**
  - **non-judgmental staff attitudes**
  - **convenient opening hours**
  - **affordable fees**

- **Quality of services**
  - **efficiency of service delivery**
  - **competence of staff**
  - **effectiveness of therapy**
  - **availability of drugs**

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Diagnostic approaches to STI

Disadvantages

- clinical

  - neither sensitive nor specific
  - mixed infections cannot be detected

- laboratory

  - simple tests not available/do not exist
  - cost: existing rapid test expensive
  - delay: results not readily available

- syndromic

  - costs of over-treatment
  - side-effects of over-treatment

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STI syndromic case management: definition

- Syndromic diagnosis:

  identification of consistent group of symptoms and easily recognised signs (syndromes)

- Syndromic treatment:

  treat the main organisms responsible for causing the syndrome

How syndromic management works

Through a series of flow-charts:

- guides the health-care worker through the correct identification and treatment of an STI-associated syndrome

- offers a package of comprehensive care from history taking, examination, to counselling/education on risk reduction and partner notification and treatment

Urethral Discharge

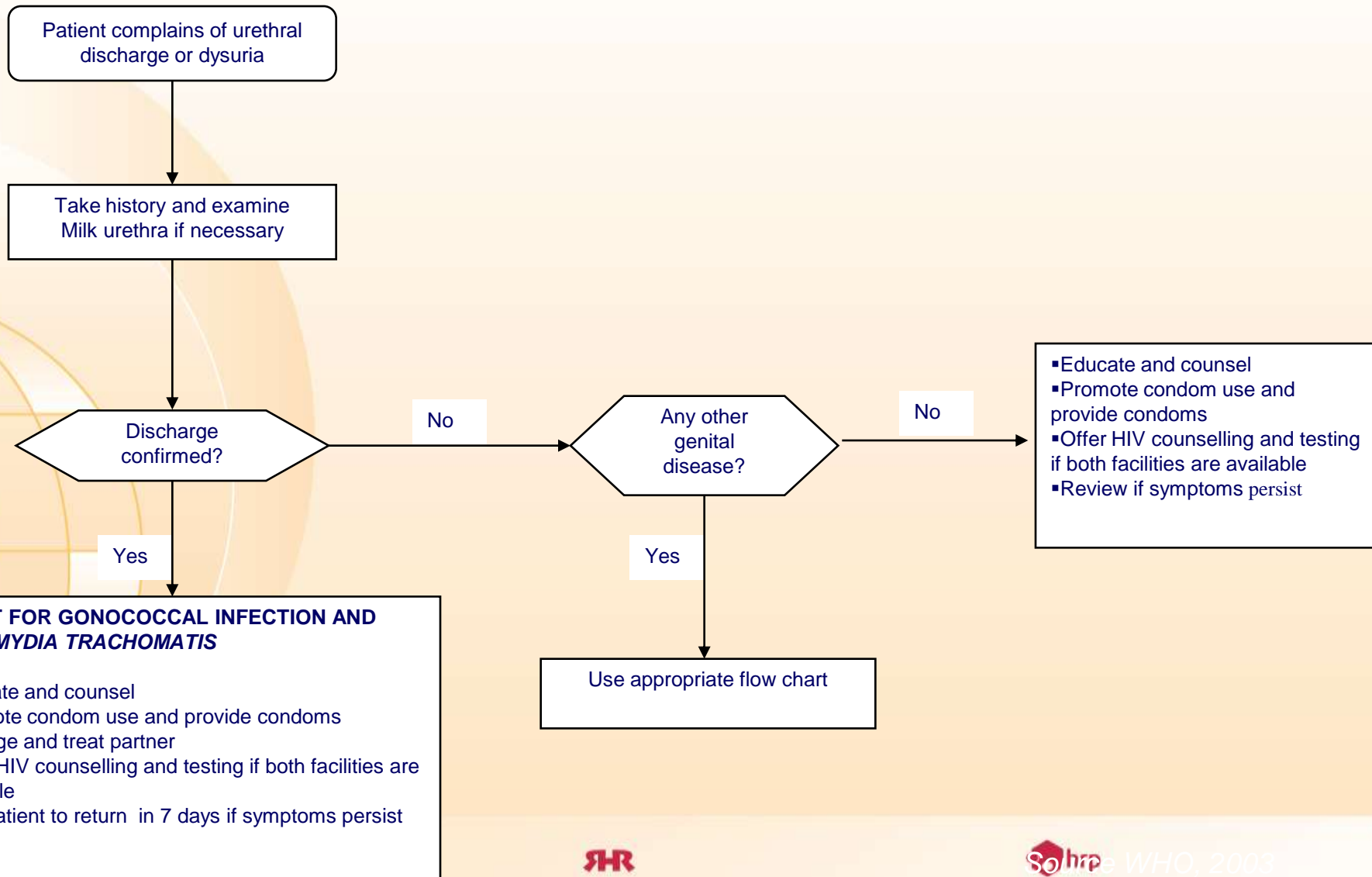Patient complains of urethral discharge or dysuria

↓

Take history and examine
Milk urethra if necessary

↓

Discharge confirmed?

→ No → **Any other genital disease?** → No →

- Educate and counsel
- Promote condom use and provide condoms
- Offer HIV counselling and testing if both facilities are available
- Review if symptoms persist

Discharge confirmed? — Yes ↓

TREAT FOR GONOCOCCAL INFECTION AND CHLAMYDIA TRACHOMATIS

- Educate and counsel
- Promote condom use and provide condoms
- Manage and treat partner
- Offer HIV counselling and testing if both facilities are available
- Ask patient to return in 7 days if symptoms persist

Any other genital disease? — Yes ↓

Use appropriate flow chart

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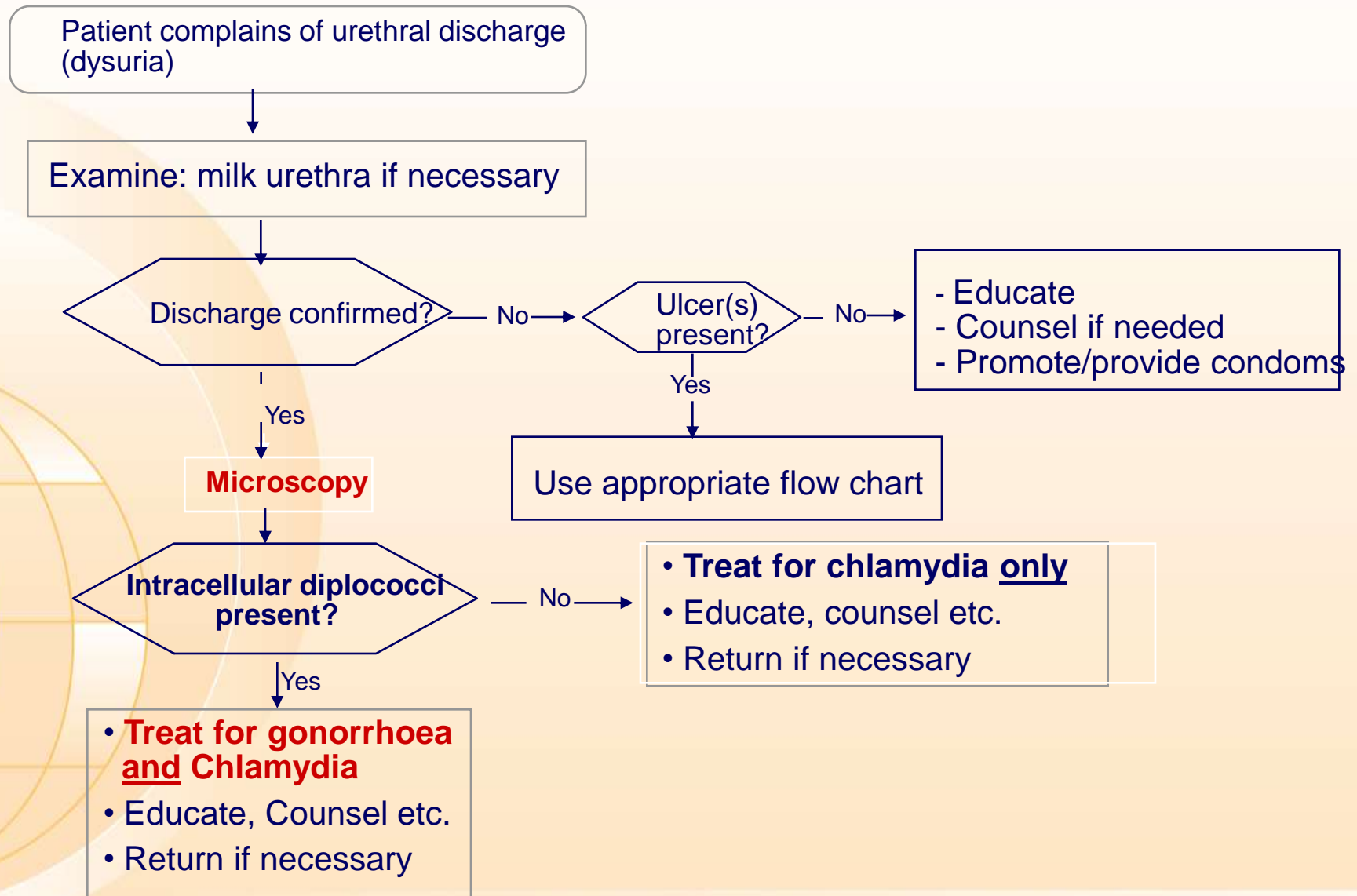
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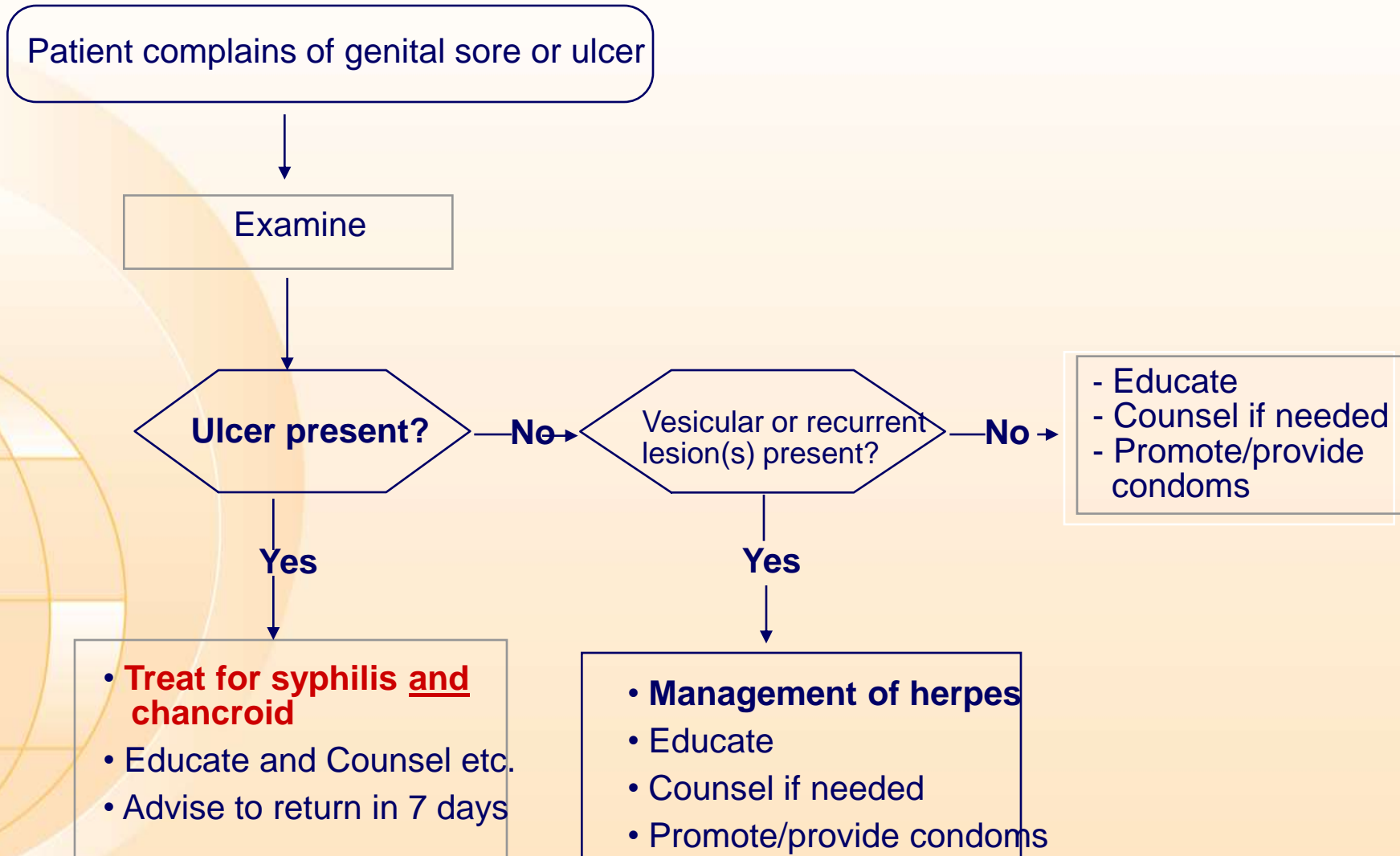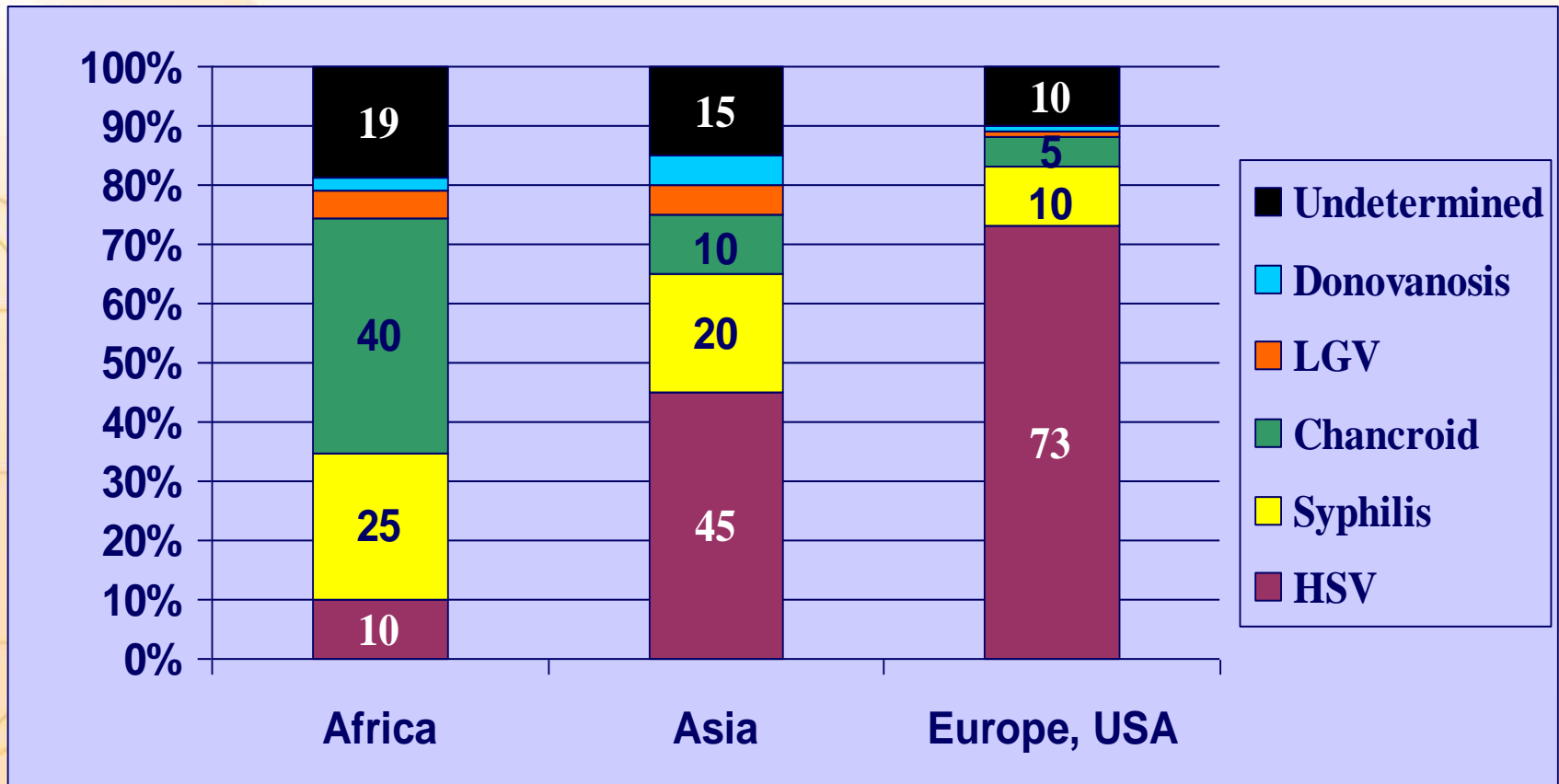and Research Training in Human Reproduction

Urethral discharge (with microscope)

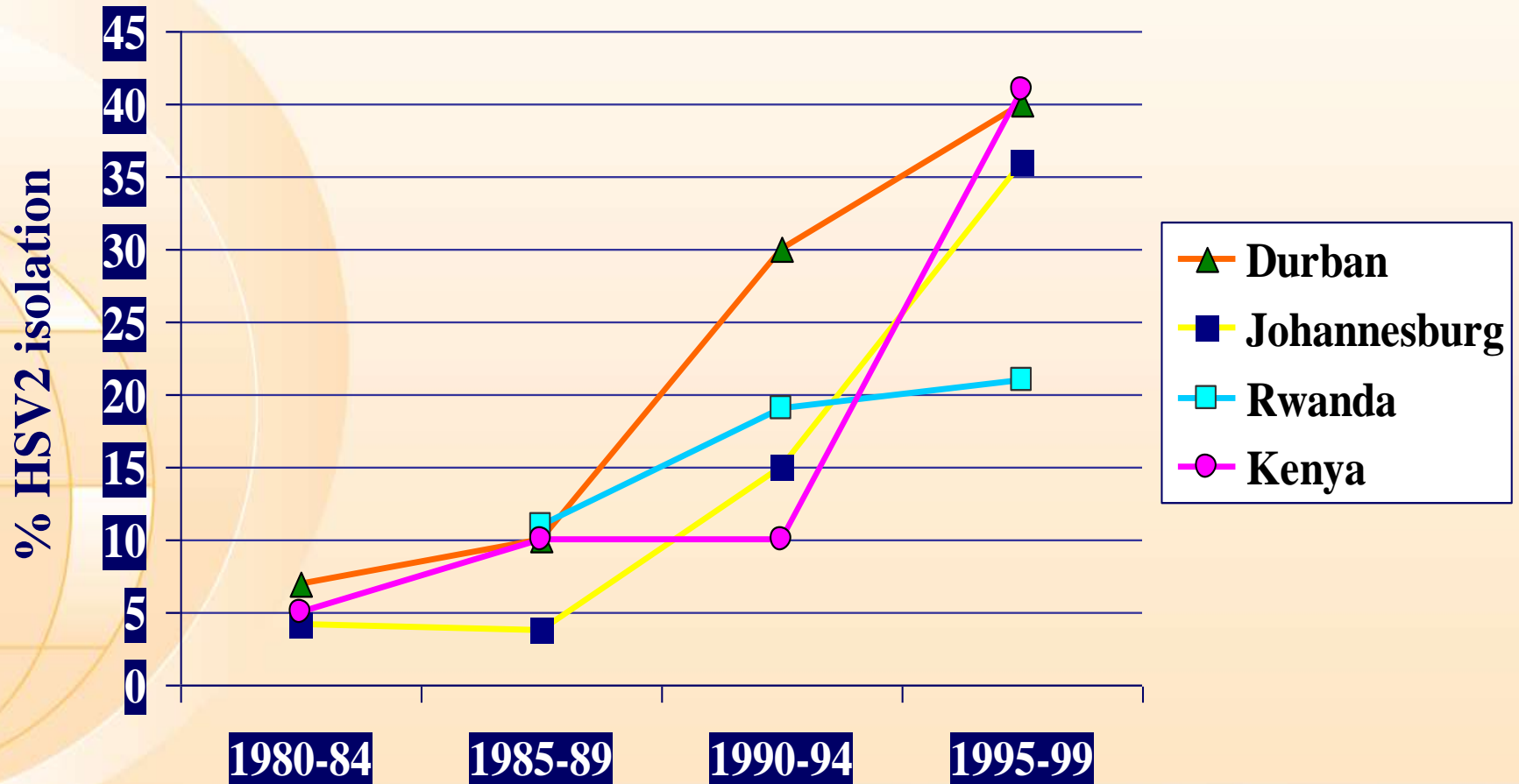Patient complains of urethral discharge (dysuria)

↓

Examine: milk urethra if necessary

↓

Discharge confirmed? — No → **Ulcer(s) present?** — No → - Educate
- Counsel if needed
- Promote/provide condoms

Yes ↓

Microscopy

↓

Intracellular diplococci present? — No → • **Treat for chlamydia <u>only</u>**
• Educate, counsel etc.
• Return if necessary

Yes ↓

• **Treat for gonorrhoea <u>and</u> Chlamydia**
• Educate, Counsel etc.
• Return if necessary

(from Ulcer(s) present? Yes ↓) **Use appropriate flow chart**

Genital ulcers

Patient complains of genital sore or ulcer

↓

Examine

↓

Ulcer present? —**No**→ Vesicular or recurrent lesion(s) present? —**No**→ - Educate
- Counsel if needed
- Promote/provide condoms

Yes

↓

- **Treat for syphilis <u>and</u> chancroid**
- Educate and Counsel etc.
- Advise to return in 7 days

Yes

↓

- **Management of herpes**
- Educate
- Counsel if needed
- Promote/provide condoms

Agents causing genital ulcer disease (GUD) by Region until 1990's

	Africa	Asia	Europe, USA
Undetermined	19	15	10
Donovanosis			
LGV			
Chancroid	40	10	5
Syphilis	25	20	10
HSV	10	45	73

Legend:
- ■ Undetermined
- ■ Donovanosis
- ■ LGV
- ■ Chancroid
- ■ Syphilis
- ■ HSV

Proportion of genital ulcers in which HSV-2 was isolated in Africa over time

Mayaud & Mc Cormick, Br Med Bull 2001

Aetiology of GUS by M-PCR and culture in Masaka, Uganda

Chancroid 3%

Syphilis 2%

None 32%

Herpes 40%

Multiple 10%

Other 13%
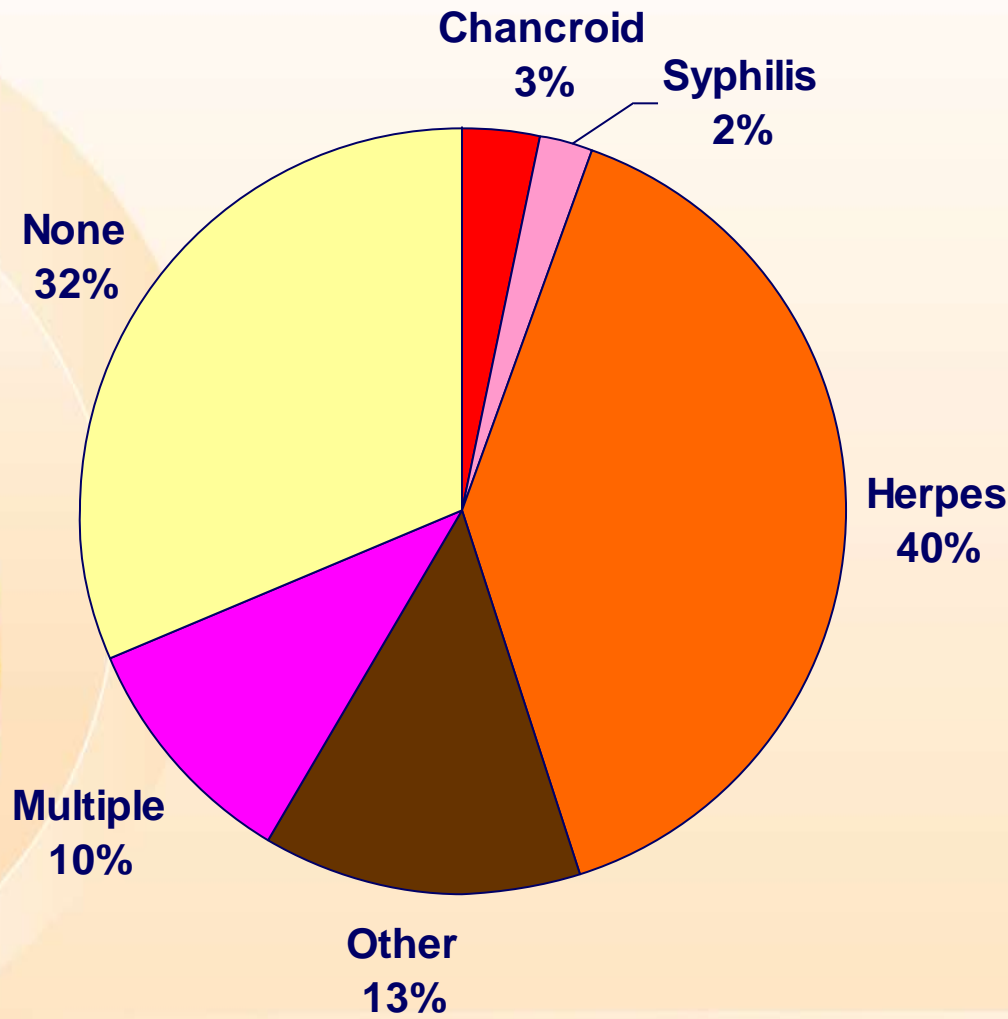
TPHA/RPR - 15%
HIV -   30%

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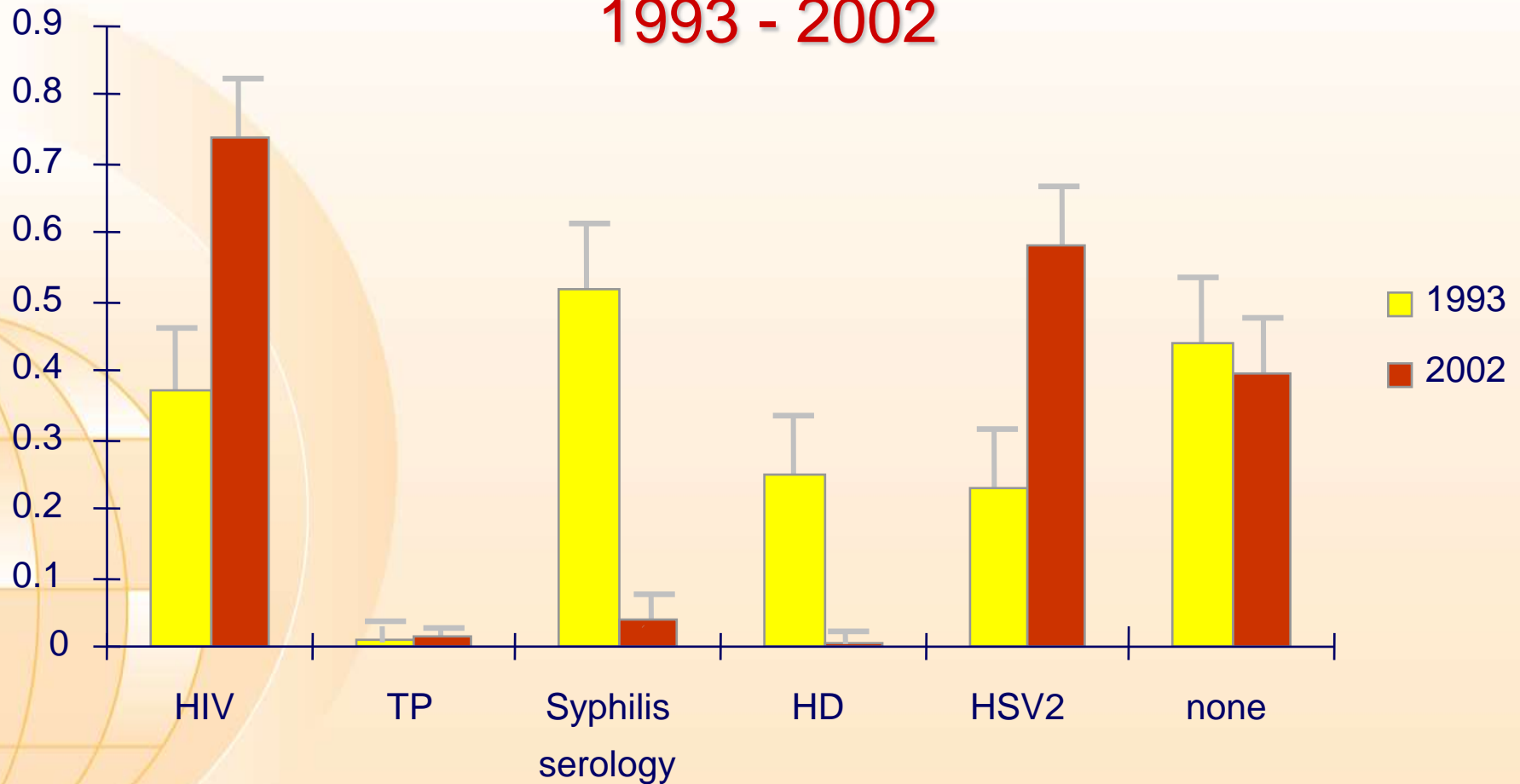
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Source: Dr. Anatoli Kamali, Uganda

Botswana
Changes in the aetiology of GUD
1993 - 2002

*In 1993 a study was done by the National AIDS Control Program in Botswana in collaboration with the STD Research Unit, South African Institute for Medical Research, Johannesburg among 108 GUD patients.

Source: M. Rahman, ISSTDR, Ottawa 2003
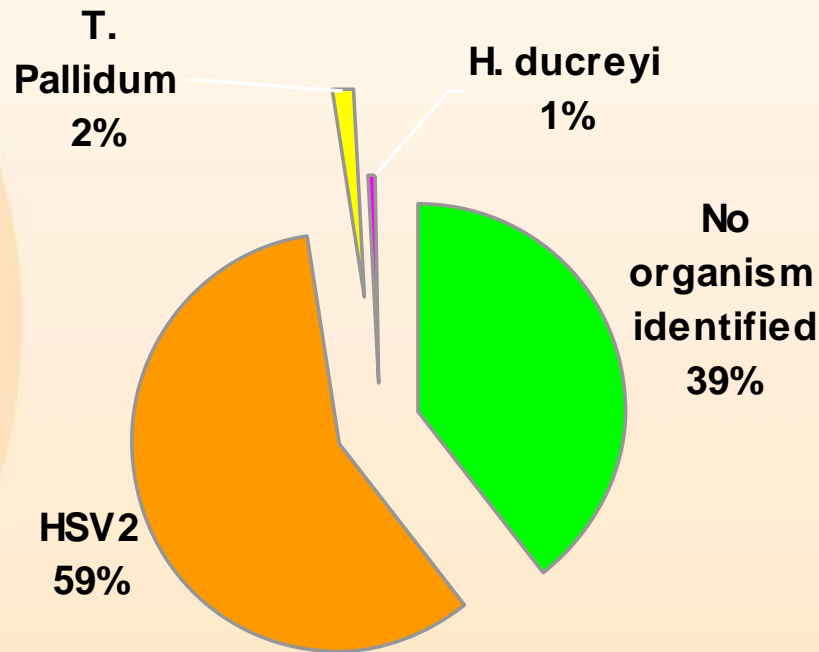
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Botswana
Aetiology of genital ulcer disease 2002

T. Pallidum 2%

H. ducreyi 1%

No organism identified 39%

HSV2 59%

N=137

TPHA/RPR - 15%
HIV - 30%

Source: M. Rahman, ISSTDR, Ottawa 2003

Current genital ulcer algorithm in Botswana

Complaint sores/ulcer on genitals

Vesicles, blisters or history of recurrence → **Yes** → Soak in warm water, educate, condoms

No

Ulcer found on genitals → **No** → Other STD? → **Yes** → Treat

No → Educate

Yes

Treat for syphilis and chancroid Review in 7 days

Ulcer healed → **Yes** → Other STD? → **Yes** → Treat

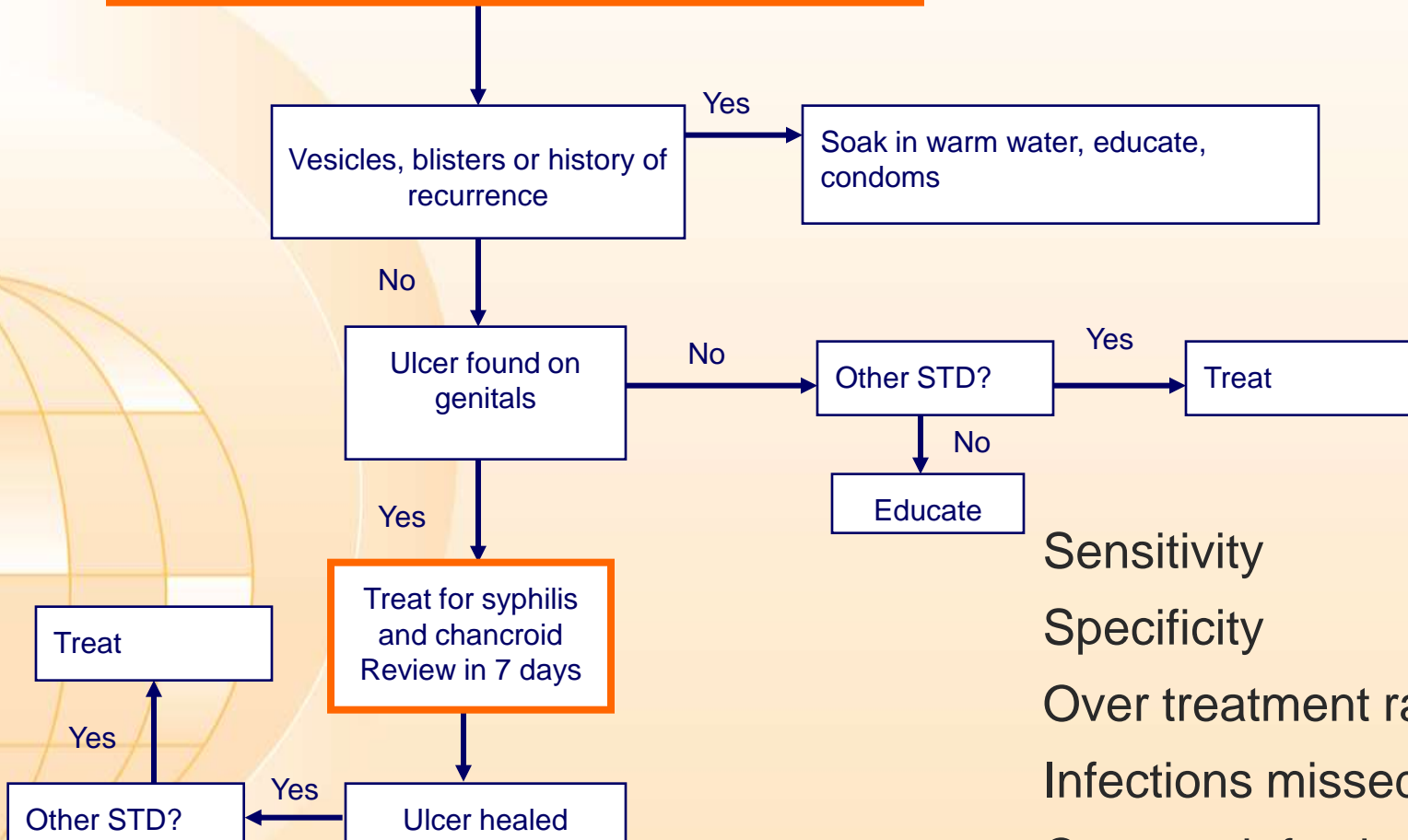|	
Sensitivity	33%
Specificity	45%
Over treatment rate	99%
Infections missed	67%
Cost per infection Tx.	$88.0

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Source: M. Rahman, ISSTDR, Ottawa 2003

Piloted genital ulcer algorithm in Botswana

Complaint of sores/ulcer on genitals

Only vesicles present? — **Yes** → Treat for **herpes**
return in 7 days if symptoms persist

No

Ulcer found on genitals — **No** → Other STI?

Yes

Treat for syphilis, chancroid and
herpes
Ask patient to return in 7 days

Ulcer healed — **Yes** → Other STI?

No

Ulcer improved but not healed continue therapy for 7 days and return

Ulcer not improved REFER

Sensitivity	99%
Specificity	13%
Over treatment rate	36%
Infections missed	1%
Cost per infection Tx.	$4.5

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Source: M. Rahman, ISSTDR, Ottawa 2003

Genital Ulcer

Patient complains of a genital sore or ulcer

↓

Take history and examine

↓

Only vesicles present? —— No ——→ **Sore or ulcer present?** —— No ——→ - Educate and counsel
- Promote condom use and provide condoms
- Offer HIV counselling and testing if both facilities are available

| Yes | | Yes |

TREAT FOR HSV2. TREAT FOR SYPHILIS IF INDICATED[1]

TREAT FOR SYPHILIS AND CHANCROID. TREAT FOR HSV2[2]

↓

- Educate and counsel
- Promote condom use and provide condoms
- Offer HIV counselling and testing if both facilities are available
- Ask patient to return in 7 days

↓

Ulcer(s) healed? —— No ——→ **Ulcer(s) improving?** —— No ——→ Refer
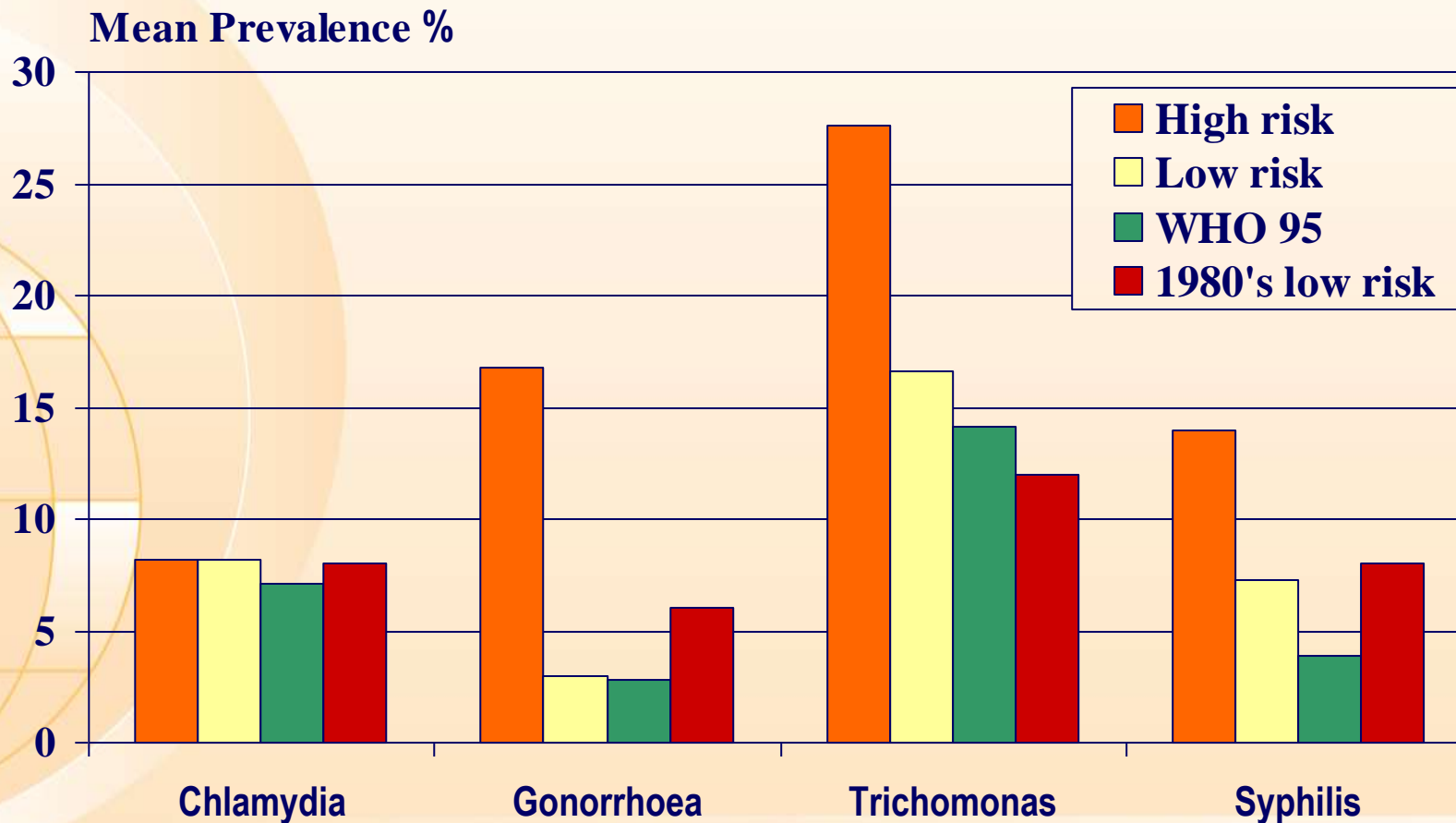
| Yes (left) | | Yes (down) |

- Educate and counsel
- Promote condom use and provide condoms
- Manage and treat partner
- Offer HIV counselling and testing if both facilities are available

←—— Continue treatment for a further 7 days

[1] indications for syphillis treatment
- RPR positive; and
- No recent syphilis treatment
[2] Treat for HSV2 where prevalence is 30% or higher, or adapt to local conditions

Prevalence of Selected STIs among Female Populations in Africa in the 1980's and 1990's

Mean Prevalence %

Legend:
- High risk
- Low risk
- WHO 95
- 1980's low risk

Categories: Chlamydia, Gonorrhoea, Trichomonas, Syphilis

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Table of selected 1990's studies; Wasserheit & Holmes, 1992; Gerbase et al , Lancet 1998

Vaginal discharge syndrome
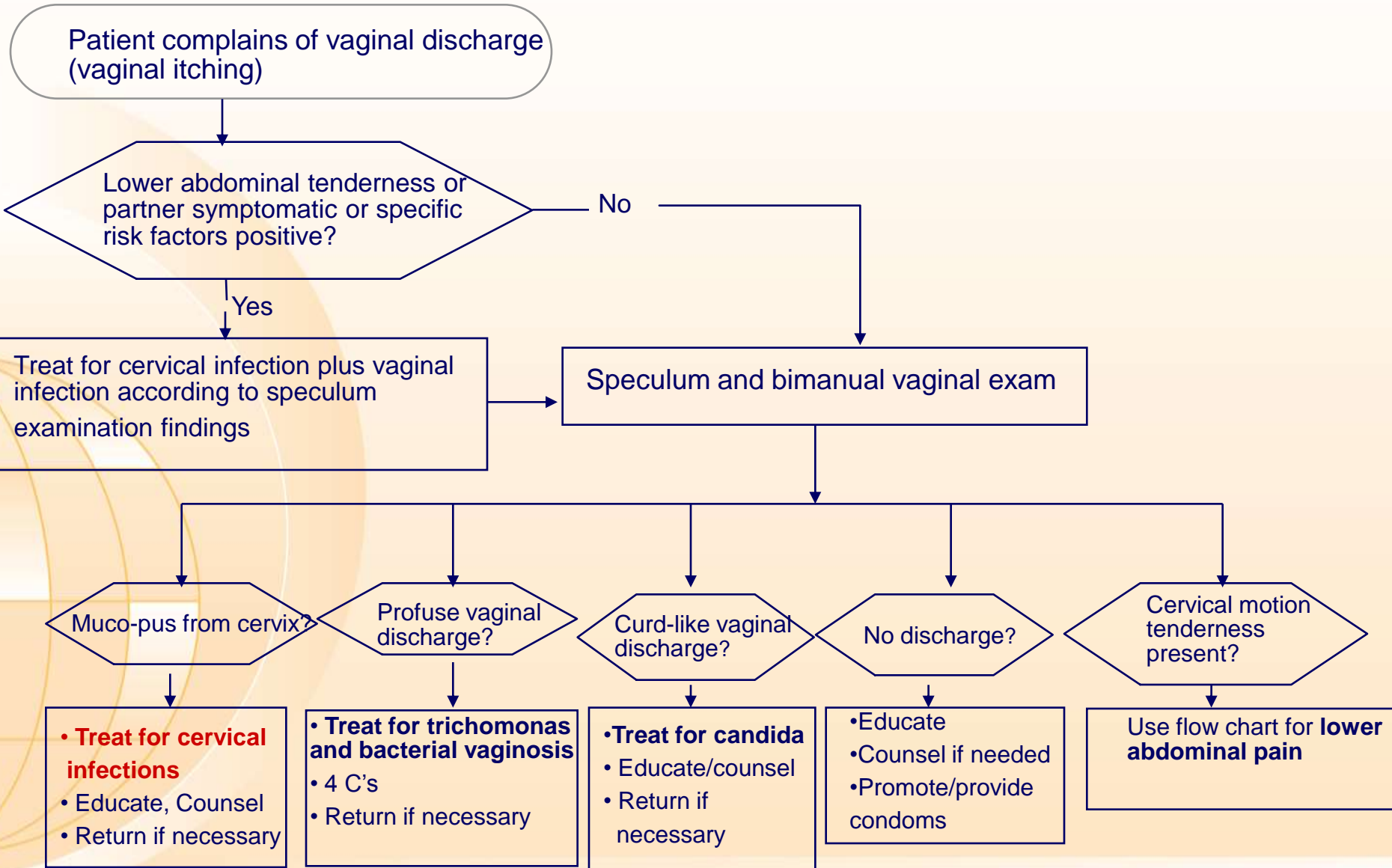
VAGINITIS

- most common causes
- easy to diagnose
  - lab tests
  - clinically
- serious complications?
  - (pregnancy)
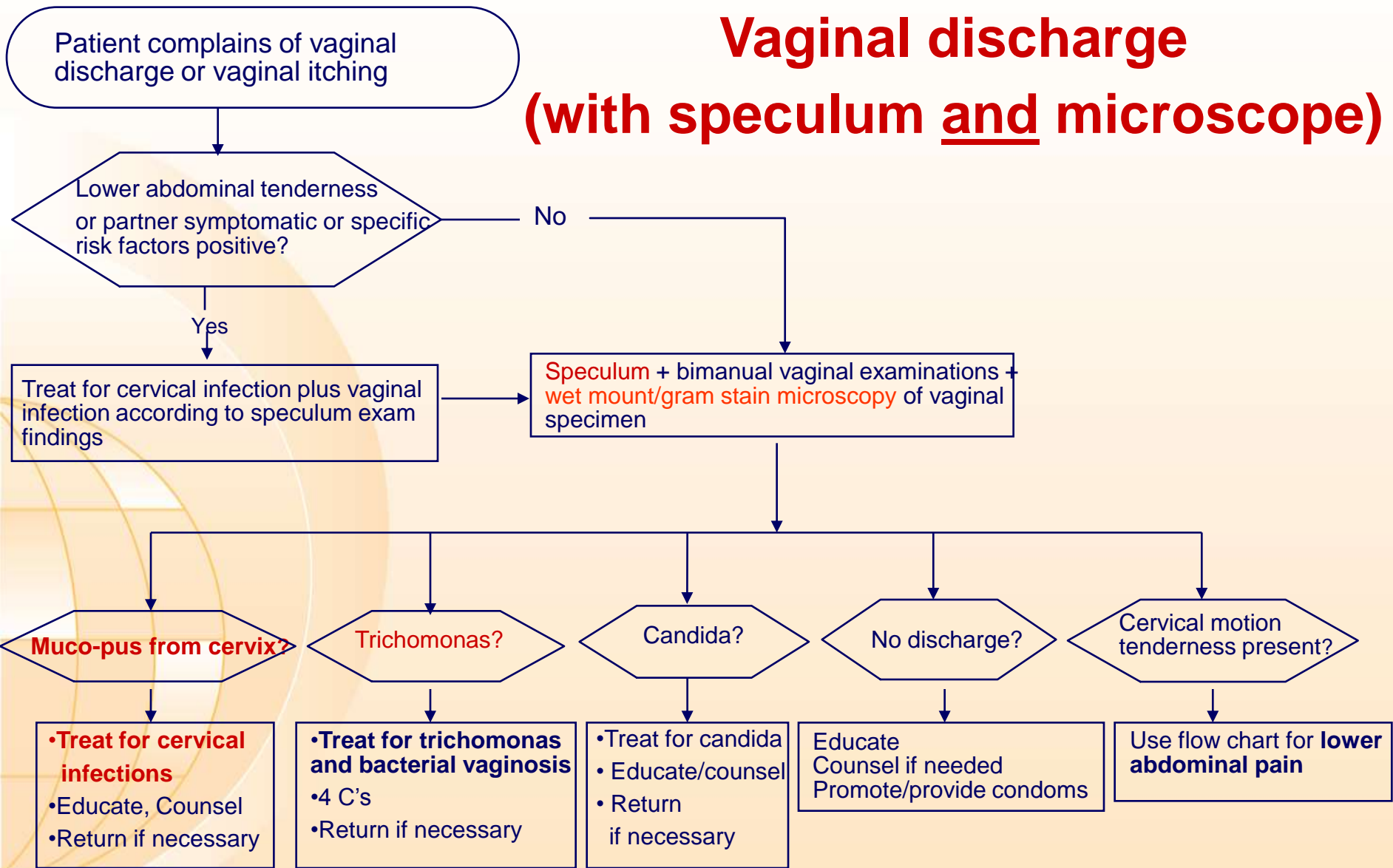 - (endometritis, PID)

CERVICITIS

- less common causes
- not easy to diagnose
  - no simple tests
- complications ++
  - PID
  - ectopic pregnancy
  - infertility

Vaginal discharge (with speculum only)

Patient complains of vaginal discharge (vaginal itching)

↓

Lower abdominal tenderness or partner symptomatic or specific risk factors positive? → No

Yes ↓

Treat for cervical infection plus vaginal infection according to speculum examination findings → Speculum and bimanual vaginal exam

↓

Muco-pus from cervix?

- **Treat for cervical infections**
- Educate, Counsel
- Return if necessary

Profuse vaginal discharge?

- **Treat for trichomonas and bacterial vaginosis**
- 4 C's
- Return if necessary

Curd-like vaginal discharge?

- **Treat for candida**
- Educate/counsel
- Return if necessary

No discharge?

- Educate
- Counsel if needed
- Promote/provide condoms

Cervical motion tenderness present?

Use flow chart for **lower abdominal pain**

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Vaginal discharge
(with speculum <u>and</u> microscope)

Patient complains of vaginal discharge or vaginal itching

Lower abdominal tenderness or partner symptomatic or specific risk factors positive? — No

Yes

Treat for cervical infection plus vaginal infection according to speculum exam findings

Speculum + bimanual vaginal examinations + wet mount/gram stain microscopy of vaginal specimen

Muco-pus from cervix?
- **Treat for cervical infections**
- Educate, Counsel
- Return if necessary

Trichomonas?
- **Treat for trichomonas and bacterial vaginosis**
- 4 C's
- Return if necessary

Candida?
- Treat for candida
- Educate/counsel
- Return if necessary

No discharge?
- Educate
- Counsel if needed
- Promote/provide condoms

Cervical motion tenderness present?
- Use flow chart for **lower abdominal pain**

Vaginal discharge
(without microscope, using risk score)

Patient complains of vaginal discharge (vaginal itching)

Lower abdominal tenderness **or** partner symptomatic **or** **risk score positive***?

No →
- Treat for **vaginal** infections
- Educate
- Counsel if needed
- Promote/provide condoms

Yes

- Treat for **cervical** and **vaginal** infections
- Educate and counsel
- Return if necessary

* Risk score = any 2 of:
- age <21
- single
- >1 partner in last 3/12
- new partner in last 3/12

Vaginal discharge

Patient complains of vaginal discharge, vulval itching or burning

↓

Take history and examine
Assess risk[1]

↓

Abnormal vaginal discharge or vulval eryrthema? — No → **Any other genital disease?** — No →
- Educate and counsel
- Promote condom use and provide condoms
- Offer HIV counselling and testing if both facilities are available

↓ Yes (Abnormal vaginal discharge)

Any other genital disease? — Yes ↓

Use appropriate flowchart for additional treatment

Lower abdominal tenderness? — No → **High GC/CT prevalence setting[2] or risk assessment positive?** — No → **TREAT FOR BACTERIAL VAGINOSIS AND *TRICHOMONAS VAGINALIS***

↓ Yes (Lower abdominal tenderness)

Use flowchart for lower abdominal pain

High GC/CT prevalence setting? — Yes ↓

TREAT FOR GONOCOCCAL INFECTION, *CHLAMYDIA TRACHOMATIS,* BACTERIAL VAGINOSIS AND *TRICHOMONAS VAGINALIS.*

→ **Vulval oedema/curd-like discharge, erythema, excoriations present?** — No →
- Educate and counsel
- Promote condom use and provide condoms
- Offer HIV counselling and testing if both facilities are available

↓ Yes

TREAT FOR *CANDIDA ALBICANS*

[1] Risk factors need adaptation to local social, behavioural and epidemiological situation.
[2] The determination of high prevalence levels needs to be made locally.

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Vaginal discharge: Bimanual & speculum, with or without microscope

Patient complains of vaginal discharge, vulval itching or burning

Take history and examine patient (external, speculum and bimanual)
Assess risk[1]
Perform wet mount microscopy of vaginal specimen for TV and yeast cells (optional)

Lower abdominal tenderness or cervical motion tenderness present? — **Yes** → Use flowchart for lower abdominal pain

No

Cervical mucopus or erosions
or
High GC/CT prevalence setting[2] or
risk assessment positive? — **No** → **TREAT FOR BACTERIAL VAGINOSIS AND *TRICHOMONAS VAGINALIS***

Yes

TREAT FOR GONOCOCCAL INFECTION, *CHLAMYDIA TRACHOMATIS*, BACTERIAL VAGINOSIS AND *TRICHOMONAS VAGINALIS*.

Vulval oedema/curd-like discharge, vulval erythema, excoriations present or yeast cells on microscopy? — **No** →

Yes

TREAT FOR *CANDIDA ALBICANS*

- Educate and counsel
- Promote condom use and provide condoms
- Offer HIV counselling and testing if both facilities are available
----
- Manage and treat partner if cervical mucopus present
- Manage and treat partner if microscopy demonstrates TV

[1] Risk factors need adaptation to local social, behavioural and epidemiological situation
[2] The determination of high prevalence levels needs to be made locally
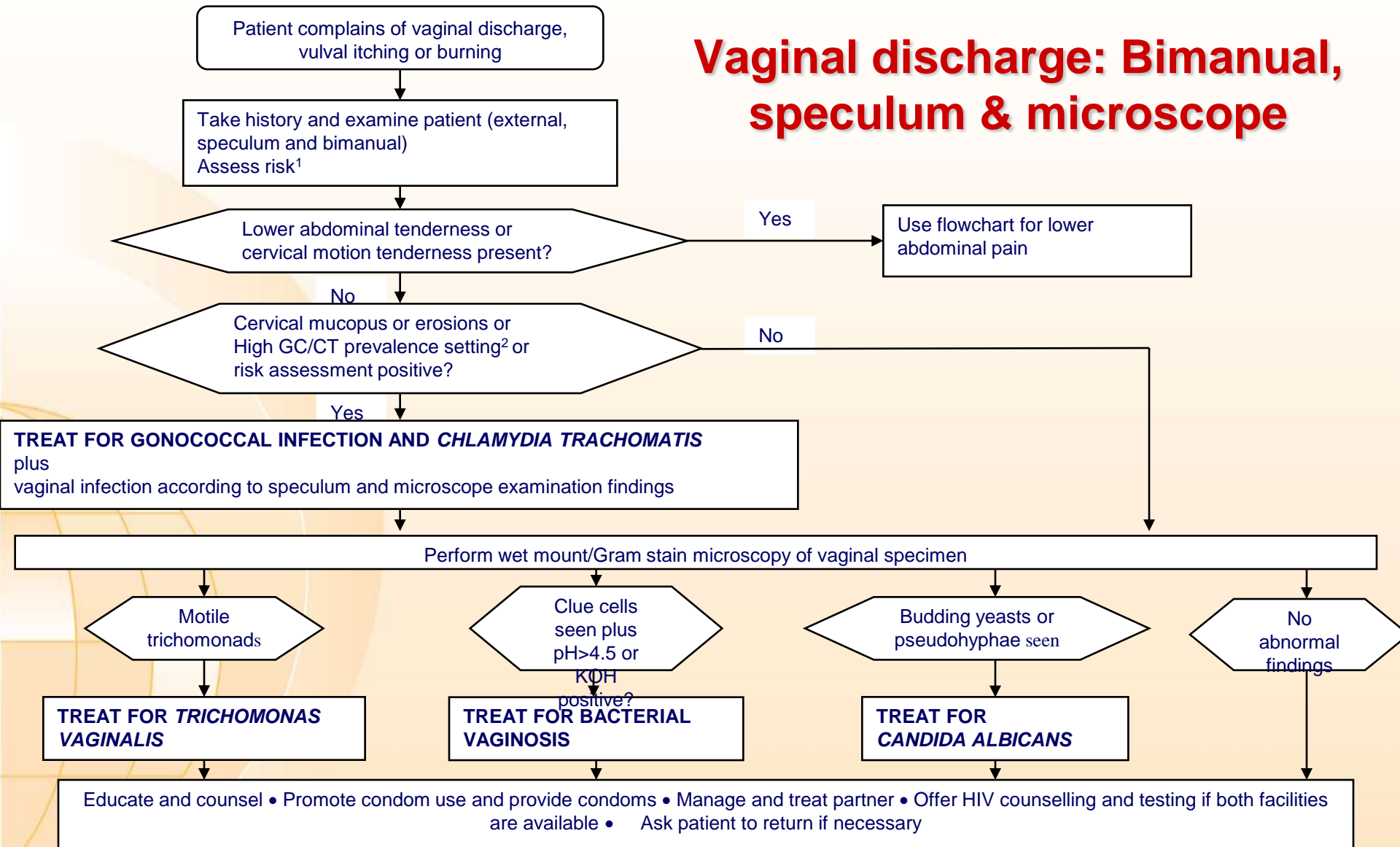
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Vaginal discharge: Bimanual, speculum & microscope

Patient complains of vaginal discharge, vulval itching or burning

↓

Take history and examine patient (external, speculum and bimanual)
Assess risk[1]

↓

Lower abdominal tenderness or cervical motion tenderness present? — Yes → Use flowchart for lower abdominal pain

No ↓

Cervical mucopus or erosions or High GC/CT prevalence setting[2] or risk assessment positive? — No →

Yes ↓

TREAT FOR GONOCOCCAL INFECTION AND *CHLAMYDIA TRACHOMATIS*
plus
vaginal infection according to speculum and microscope examination findings

↓

Perform wet mount/Gram stain microscopy of vaginal specimen

Motile trichomonads	Clue cells seen plus pH>4.5 or KOH positive?	Budding yeasts or pseudohyphae seen	No abnormal findings
TREAT FOR *TRICHOMONAS VAGINALIS*	**TREAT FOR BACTERIAL VAGINOSIS**	**TREAT FOR *CANDIDA ALBICANS***	

Educate and counsel • Promote condom use and provide condoms • Manage and treat partner • Offer HIV counselling and testing if both facilities are available • Ask patient to return if necessary

[1]Risk factors need adaptation to local social, behavioural and epidemiological situation
[2] The determination of high prevalence levels needs to be made locally

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IMPLEMENTATION

1. Pre-requisite information

- Prevalence of STIs
- STI treatment-seeking behaviour
- Treatment practices & counselling (PI6 & PI7)
- Level of (and capacity for) training of implementers
- Drug policy, ordering and distribution system
- Stakeholders involvement
- Review of literature (need 'evidence criteria')

IMPLEMENTATION

2. Conduct or analyse aetiological studies

- Genital ulcer syndrome
- Male genital discharge syndrome
- Female genital discharge (+/- risk-assessment)
- Resistance patterns

3. Assess if there is need to depart from WHO or existing national/regional algorithms

4. Adaptation for high/low risk environment

- high/low prevalence area
- high risk/low risk populations

IMPLEMENTATION

5. Determine the role of the laboratory

- for case management (and monitoring as 'test of cure')
- for screening and case finding
- for supporting research

6. Determine levels of use/capacity

- will influence flowchart design & need pre-testing
- will influence choice of drugs
- depends on referral patterns

IMPLEMENTATION

7. Drug selection: criteria for the choice of drugs (WHO, 2003)

- – efficacy (cure at least 95% of those infected)
- – safety
- – cost
- – compliance and acceptability
- – availability (e.g. at primary health care level)
- – use in pregnancy
- – broad spectrum (can cover co-existing infections)
- – resistance unlikely to occur rapidly

IMPLEMENTATION

8. Printing and distribution (and translation) of flowcharts

9. Training

- post-service institutional training
- on-the-job training
- pre-service training
- what cadres to train

10. Drug procurement and distribution

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IMPLEMENTATION

11. Monitoring and Supervision

- WHAT?
  - clinical outcomes on returnees and non-returnees
    - » cured/ improved/ treatment failures
    - » referral/ no follow-up
  - *Neisseria gonorrhoeae* susceptibility
  - aetiological surveys
  - quality of care (PI6, PI7)
- HOW (universal? sentinel sites? standardised protocols? consensual workshops)
- WHEN?

12. Evaluation scheme

Monitoring & Evaluation

Assess the epidemic and the response

Evaluate programme and interventions

Advocate for STI inclusion in the health- care agenda

Train and supervise

Adopt and adapt evidence -based interventions

Strengthen STI programme management and intervention activities

Evaluation of Algorithms

- Validity: sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV)

- Feasibility: infrastructure, personnel

- Cost: direct and indirect costs, cost/effectiveness

- Acceptability: health care provider, STI patient, programme manager

Validity of an algorithm (1):

Comparison between:

- Outcome of the algorithm
  - Simulation studies
  - Real outcome in field conditions

- Gold standard diagnosis
  - Laboratory tests

Validity of an algorithm (2)

- Calculation: 2 x 2 table
  - sens, spec, PPV, NPV

- Interpretation: 2 x 2 table
  - correctly treated, over treated, missed infections

Validity of an algorithm Interpretation

Gold Standard test

		+	**-**
Algorithm	**+**	A: (true +ve) Correctly treated	B: (false ve+) Over-treated
	-	C: (false -ve) Missed infections	D: (true -ve) Correctly diagnosed as negative
		Total infected	Total not infected

Validity of an algorithm Interpretation

Gold Standard test

Algorithm		**+**	**-**
	+	A: (true +ve)	B: (false ve+)
	-	C: (false -ve)	D: (true -ve)
		Total infected	Total non infected

Sensitivity: A/A+C
Specificity: D/B+D
Positive Predictive Value: A/A+B
Negative Predictive Value: D/C+D

COST PER CASE CURED

$$\frac{\text{Total cost of all diagnoses + treatments}}{\text{Number of cases cured}}$$

Cost per case cured decreases if

- ▲ **prevalence increases**
- ▲ **specificity of flowchart increases**

END