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What is an integrated care pathway?

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- An **integrated care pathway** (ICP) is a multidisciplinary outline of anticipated care, placed in an appropriate timeframe, to help a patient with a specific condition or set of symptoms move progressively through a clinical experience to positive outcomes.
- Variations from the pathway may occur as **clinical freedom** is exercised to meet the needs of the individual patient.
- ICPs are important because they help to **reduce unnecessary variations** in patient care and outcomes. They support the development of **care partnerships** and **empower patients** and their carers.
- ICPs can also be used as a tool to incorporate **local and national guidelines** into everyday practice, manage **clinical risk** and meet the requirements of clinical governance.
- When designing and introducing ICPs, it is important to incorporate them into **organisational strategy** and choose appropriate topics which will provide opportunities for improvement.

Prescribing information is on page 8

Using ICPs to improve outcomes

An ICP is a multidisciplinary outline of anticipated care for patients with a similar diagnosis or set of symptoms. The ICP document specifies the interventions required for the patient to progress along the pathway and places them against a timeframe measured in terms of hours, days, weeks or milestones (Box 1).

Initially, the development of pathways concentrated on surgical procedures and 'predictable' medical conditions with a definable sequence of events, but attention is increasingly turning to more complex medical conditions and patients treated in the community.

ICPs are **'patient-focused'** as they view the delivery of care in terms of the 'patient's journey' and seek to improve both the coordination and the consistency of care. Emphasis is placed on the provision of appropriate care – that is, what is suitable for each individual patient in relation to the clinical evidence base and/or consensus of best practice.

In practical terms, the ICP can act as the single record of care, with each member of the multi-disciplinary team required to record his or her input on the ICP document. The use of both process-based (ie, the tasks to be performed) and outcome-based documentation (ie, the results to be achieved) acts as a guide to decision making and provides each professional with valuable information about the patient's condition while also monitoring his or her progress.

Variations from the ICP

While the ICP acts as a template of the care to be provided to the chosen group of patients, it is not intended to compromise clinical judgement. Any member of the clinical team can deviate from the pathway if there is a valid reason for doing so. In essence, the pathway asks each clinician to determine whether each defined intervention is appropriate for a given patient, thereby promoting clinical freedom based on the needs of the individual. Variations from the pathway are actioned immediately, with remedial activity undertaken to return the patient to the ICP.

Subsequent analysis of variations from the pathway provides information to the clinical team on the overall quality of care and helps to identify any trends that may require further investigation. This, in turn, supports the management of clinical risk and allows modifications and improvements to be made to the content of the pathway. ICPs are dynamic documents, and change is to be expected as new evidence, clinical guidelines and treatment patterns emerge.

Why are ICPs important?

ICPs are important because, by providing **explicit standards**, they help to reduce unnecessary variations in patient care and outcomes. They can improve

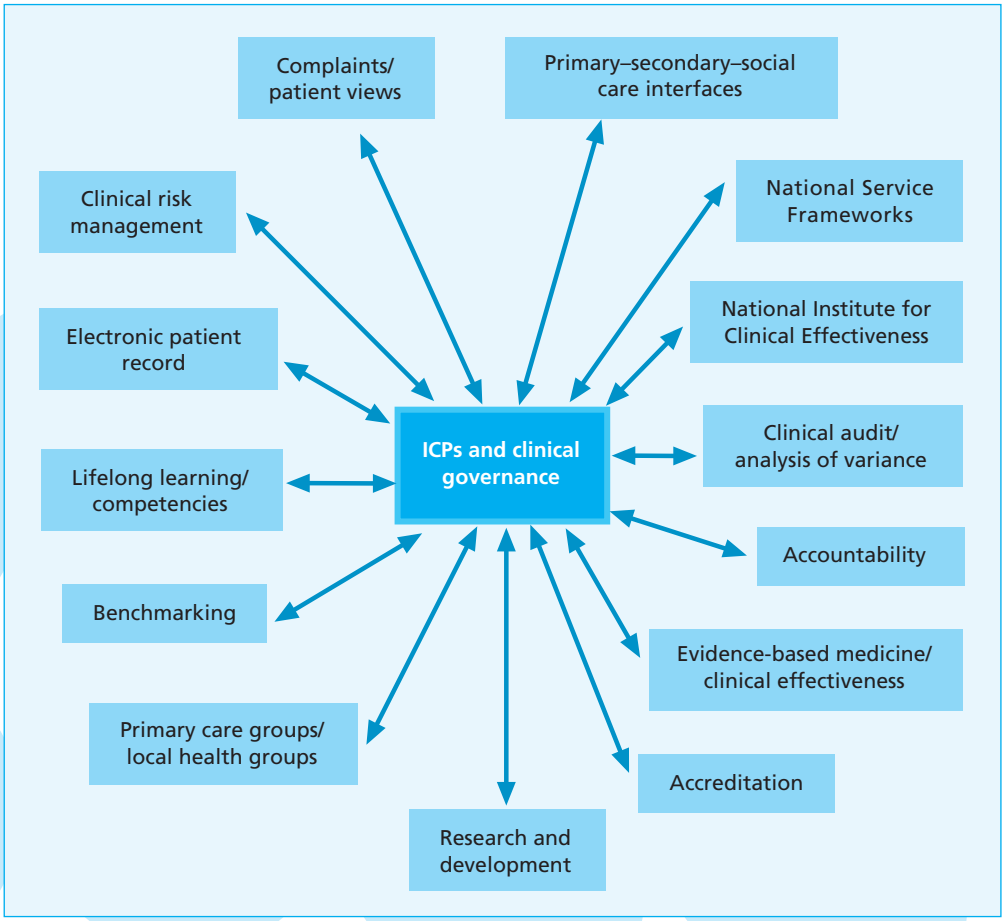
Box 1. Clinical pathways matrix[1]

Patient's name: *Expected length of stay: 3 days*

Objective:

	Timeframe			
Intervention	**Pre-admission**	**Day 0 Admission**	**Day 1**	**Day 2 Discharge**
Clinical assessment				
Treatment				
Medication				
Discharge plan				
Tests				
Activity				
Outcomes				
Patient education				
Variations				

Figure 1. The quality agenda



multidisciplinary (and multi-agency) communication and collaboration, empower and inform patients and their carers, and help to meet the requirements of clinical governance (Figure 1).

The use of ICPs allows clinical teams to identify strengths and weaknesses within areas of clinical activity and to ensure that clinical guidelines and available evidence are incorporated into everyday practice. Routine monitoring of ICPs and retrospective analysis of variations help to highlight areas of clinical risk and complete the clinical audit cycle. The ICP makes explicit the standard(s) of care against which actual care can be judged. Deviations from this standard can be used to inform changes in practice and to assess the relationship between different interventions and individual patient outcomes.

The ICP defines the relationships that exist between the professionals and agencies involved in delivering care to specific patient groups. All members of the clinical team are given a clear idea of what is expected of them, and for this reason ICPs can also be used as an integral feature of ongoing professional training and orientation programmes for new and bank staff. The time spent documenting patient care is also reduced, and full compliance with ICPs meets the United Kingdom Central Council standards for clinical record keeping.

Patients whose care is managed through an ICP are given realistic expectations about their condition and their expected progress. Patients and their carers are also encouraged to ask questions about the nature of their care, and some sites are actively developing patient pathways to support this process. This will help to improve patient satisfaction and reduce complaints.

Critical success factors

The delivery of these benefits is, however, dependent on compliance with several critical success factors. These can be defined as:

- ICPs are included as part of an **organisational quality programme**.
- Collaboration exists between professional groups, with a strong medical lead.

What is an ICP?

Box 2. Choosing an appropriate topic

When selecting an appropriate topic to develop an ICP, the following criteria should be taken into consideration:

- Common condition (high percentage of patients) *or*
- High-risk condition *or*
- Problem area (with opportunities for improvement) *or*
- Staff expressed preference (to ensure commitment)

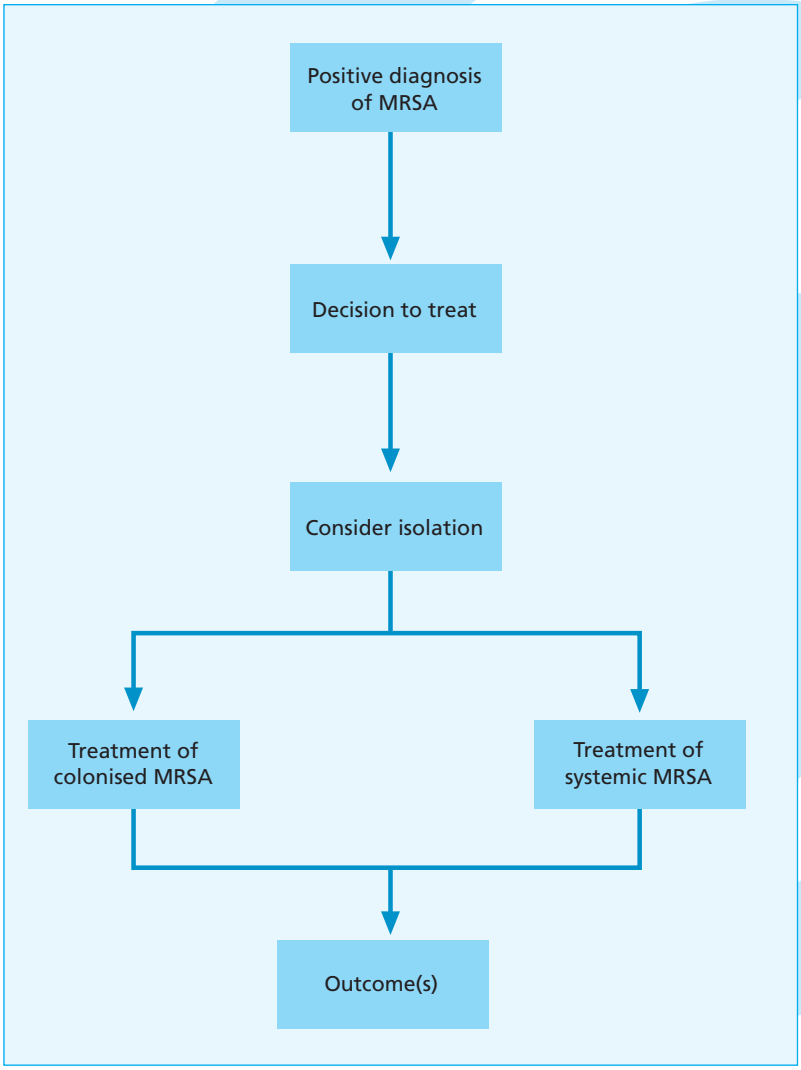


Figure 2. 'High-level' process map for management of methicillin-resistant *Staphylococcus aureus* (MRSA)

- Appropriate topics are chosen, and ICPs are based on available evidence/best practice and include goals and outcomes.
- Project facilitators have appropriate skills, and the expectations of staff are clearly managed.
- Variations from the ICP are collected and analysed.
- ICPs are 'owned' by clinical staff and completed by all staff involved.

The presence of all these success factors helps to ensure that ICPs are used 'to make a difference'. Evidence suggests that successful ICPs can improve both patient satisfaction and outcomes, reduce length of stay and promote appropriate targeting of resources. Such a 'patient-focused' approach to therapeutic management also helps to improve patient care and reduce duplication of effort. By standardising best practices, actively managing risk and facilitating primary, secondary and social care interfaces – as well as significantly reducing administrative load – ICPs should provide a powerful and welcome clinical and operational tool.

How to develop an ICP

ICPs work best when the decision to develop them is taken on an organisational basis. This allows the development process to be aligned with organisational objectives, and a business case can be developed for each chosen topic (Box 2). This approach also helps to demonstrate senior management commitment to the principles of ICPs.

A key feature in the development of ICPs is often the appointment of a designated **facilitator** to manage the ICP programme. The role of the facilitator is to provide ongoing education and support and to act as a link between different professional groups. To perform this role successfully the facilitator will require a wide range of skills, including the ability to lead and motivate others and to work well under pressure and to strict deadlines.

Process maps

The first stage of ICP development is essentially a baseline review of current practice for the chosen group of patients, undertaken by representatives of the

multidisciplinary team. This review will involve agreeing the scope and boundaries of the pathway, the desired outcomes of care and the development of a multidisciplinary **process map.** A process map is a 'picture' of the plan of care (Figure 2, opposite). The process map will help to define:

- The sequence of steps and activities performed during delivery of care to the chosen patient group.
- Specific responsibilities for these steps and activities.
- The relationships that exist between the different individuals and departments in the process.
- Potential problem areas ('failure points') and opportunities for improvements in current practice.

The completed process map will form the basis of the final ICP document. It can also be used to test existing practice against available evidence or the practice of different clinicians and organisations. A case-note review of the last 10–20 patients from the chosen patient group will help to complete this map.

The ICP document

Before translating the process map into an ICP document, some thought needs to be given to the format of the pathway. ICP documentation needs to be clear, simple and easy to use and, where possible, consistent with the style of ICPs used in other clinical areas.

Compiling the ICP document is essentially achieved by analysing the completed process map in order to establish:

- Manageable steps along with an appropriate timeframe.
- Decision points within the process and assessment tools to be used. This may include steps to be taken to manage 'common' variations from the expected or known risks (such as methicillin-resistant *Staphylococcus aureus* (MRSA) or deep vein thrombosis). Such an ICP could be used as a stand-alone document or in conjunction with ICPs for other conditions.
- The investigations and interventions to be performed, and who is the most appropriate professional to perform them.
- Criteria for referral to other professionals and agencies.
- Milestones and outcome measures, and any guidelines or protocols to be included.
- Monitoring arrangements.

There follows an example of a generic ICP document for the management of adults with MRSA (pages 6–7). These pages are intended as an example to help in the development of your own documents; ICPs need to reflect local conditions and guidelines and these will obviously alter content.

The first page gives guidance on the use of the ICP, and explains its components including the identification of the decision points that determine the appropriate management plan. The decision to treat form should be completed first then the relevant management plan sheet, as listed below:

- Treatment of adult patients colonised with MRSA.
- Systemic treatment of adult patients infected with MRSA.

References
1. Middleton S, Roberts A. *Clinical Pathways Workbook.* Wrexham: VFM Unit, 1998; 6.

Example of an integrated care pathway for the ma

Guidance for use

This ICP represents usual practice, and variations are expected as clinical staff use their own professional judgement.

ICP developed 1.2.2000 **Review date 1.2.2001**

The main source of information for this ICP was the Hospital Infection Society (1998) Working Party Report: Revised guidelines for the control of methicillin-resistant *Staphylococcus aureus* infection. *J Hosp Infect* 1998; **39:** 253–290.

Local protocols may differ as the guidelines must be adapted to fit in with local circumstances.

Decision to treat

Following a positive result of MRSA from the pathology department, an informed decision is to be made to treat or not treat the patient. Please complete all the boxes and sign at the bottom of the page.

Outcomes:

1. Decision to treat based on site of infection and degree of risk to other patients.
2. Isolation precautions are met.

Outcome 1 achieved *yes* ❑ *no* ❑
Outcome 2 achieved *yes* ❑ *no* ❑

Management plan for treatment of adult patient colonised with MRSA

Use this page only when managing a colonised infection.

Outcomes:

1. Infection is contained to patient identified with MRSA.
2. Treatment is successful.

Outcome 1 achieved *yes* ❑ *no* ❑
Outcome 2 achieved *yes* ❑ *no* ❑

Management plan for systemic treatment of patient infected with MRSA

Use this page only when managing a systemic infection.

Outcomes:

1. Treatment successful.
2. Plasma levels, liver function tests and clinical checks are monitored.

Outcome 1 achieved *yes* ❑ *no* ❑
Outcome 2 achieved *yes* ❑ *no* ❑

Recording of variance

Variance from the planned care must be recorded, signed and dated, together with the reason why this happened and the alternative plan of care.

Decision to treat

Patient name: Hospital number:

Please remember: *Staff hands are the main route of cross-infection in wards.
*Early communication is essential in minimising spread of MRSA

Site	Colonised (Organism is present but not causing symptoms of infection)	Infected (Organism is present and has resulted in signs and symptoms of infection)
Nose		
Throat		
Perineum/groin		
Skin lesion		
Burn		
Catheter urine		
Indwelling intra-vascular catheter		
Central line		
Intravenous infusion		
Tracheostomy		
Sputum		

If there are **any** variances to ICP, please sign and date the reason(s) and alternative action taken

Low risk Medical ward, general and acute elderly care, non-neonatal paediatrics	• Isolate if possible • Basic infection control measures • Full screen of index case • Topically treat **NB:** screening of other patients is not necessary	
Moderate risk General surgery, urology, neonatal, gynaecology/obstetrics, dermatology	As above plus: • Screen other patients in the event of two or more cases	
High risk Intensive care unit, special care baby unit, transplantation, cardiothoracic, burns, orthopaedic, trauma, vascular, regional, national/international referral centres	As above plus: • Isolate in single room • Screen other patients in the unit after one case • Treat patient topically (and systemically if necessary) • Policy of admission screening is advised	• Inform hospital hotel services • Place isolation notice on door • Discuss with patient • Give written information to visitors

Isolation precautions

Hand washing following contact
Gloves when dealing with infected site(s)
Apron for close contact

Decision to treat

Colonisation: *yes* ❑ *no* ❑
Infected site: *yes* ❑ *no* ❑

Signature Date / /

Treatment of adult patient colonised with MRSA

Patient name: Hospital number:

Please remember:

- Re-emergence of resistant strains is common; these patients should always be considered as carriers
- If surgery is required, systemic prophylaxis may be necessary
- Treatment may be decided upon due to risk and vulnerability of other patients
- A carrier may become a heavy disperser of Staphylococcus if he/she develops an upper respiratory tract infection
- The throat is more likely to be infected if the patient has dentures

Management: five-day topical treatment plan

		1	2	3	4	5
Nasal	Bactroban **Nasal preparation** Apply to nose three times a day					
Axillae and groin	Hexachlorophane powder (Sterzac) apply daily					
Broken skin	Bactroban **Skin preparation** Apply to any small broken skin sites daily					
Daily bathing	Triclosan 2% Apply to wet skin					
Shampoo	Triclosan 2% Apply on days 1 and 3		X		X	X

Is this the 1st ❑ or 2nd ❑ treatment?

Doctor's signature: Date:

Screening schedule	Date taken	Results due	Positive/ negative
48 hours after treatment ends (day 7)			
48 hours after 1st screen (day 9)			
48 hours after 2nd screen (day 11)			

Patient is clear only when 3rd set of swabs are negative

If any of three screens positive, start 2nd treatment cycle

If positive after 2nd treatment cycle, contact infection control team for further advice

Transfer/discharge of patients

Inform relevant people
Wear gloves and apron, and wash hands
Send curtains for cleaning
Decontaminate non-disposable equipment with detergent and water folled by weak hypochlorite solution
Allow all surfaces to dry before using equipment/room again
Place last on list for OPD or surgery

If there are **any** variances to ICP, please sign and date the reason(s) and alternative action taken

Systemic treatment of adult patient infected with MRSA

Patient name: Hospital number:

Please remember:

- Delay in initiating effective MRSA therapy is a significant mortality risk factor
- Intensive care patients have a higher risk of developing MRSA infection than medical patients
- A combined medical and surgical approach may be necessary

Drug 1	Dose	Route	Duration	Frequency	Signature and date

Monitoring **Caution**

Drug 2	Dose	Route	Duration	Frequency	Signature and date

Monitoring **Caution**

Side-effect	Present (date)	Drug stopped (specify)
Inflammation		
Pain		
Oedema		
Nausea/vomiting		
Diarrhoea		
Rash		
Headache		
Pruritus		

Treatment of side-effect(s)

Isolation precautions

Hand washing following contact
Gloves when dealing with infected site(s)
Apron for close contact

If there are **any** variances to ICP, please sign and date the reason(s) and alternative action taken

nagement of adults with MRSA

Systemic treatment of adult patient infected with MRSA (continued)

Vancomycin or teicoplanin, possibly combined with rifampicin, may be used for severe infections
For continuing treatment or less severe infection, a combination of rifampicin and fusidic acid may be used (if organism susceptible)
Quinupristin/dalfopristin should be reserved for unresponsive severe infections or for when IV therapy is appropriate

Drug	Dose	Route	Frequency	Guidance on dosage until levels available
Vancomycin	1,000 mg	IV, given over at least 100 mins	12-hourly	CrCl (ml/min): >50: 12-hourly 30-50: 24-hourly <30: load, then measure levels*

Monitoring

Plasma levels

Pre-dose 'trough' 5–10 mg/l checked at 48 hours

If >10 mg/l increase dose interval/perhaps omit a dose

Monitor every two days when previous level satisfactory

Renal function tests may be helpful

Clinical checks on hearing (eg, tinnitus)

*Discuss with microbiologist

Drug	Dose	Route	Frequency	Guidance on dosage until levels available
Teicoplanin	400 mg (reduced from day 4 in renal impairment)	IV	12-hourly for three doses, then daily	Reduced renal function: CrCl (ml/min): 40–60: reduce by 50% <40: reduce by 66%**

Monitoring

Plasma levels helpful in complex cases

Pre-dose ('trough') >10 mg/l

Post-dose ('peak') 20–50 mg/l

**Discuss with microbiologist if patient on renal support

Drug	Dose	Route	Frequency	Caution
Rifampicin	600–1,200 mg	Oral or IV	Daily (divided doses)	Rifampicin must always be combined with another agent active against MRSA in order to prevent emergence of resistance

Monitoring Liver function tests

Drug	Dose	Route	Frequency	Caution
Fusidic acid	500 mg	Oral	8-hourly	

Monitoring Liver function tests

Drug	Dose	Route	Frequency	Caution
Quinupristin/ dalfopristin	7.5 mg/kg	IV or CVC, given over 60 mins	8-hourly	Use with caution in impaired renal function Quinupristin/dalfopristin is incompatible with saline solutions – mix with 5% glucose

Monitoring Liver function tests

What is an ICP?

Abbreviated Prescribing Information: Rifadin
Presentations: Capsules containing 150mg and 300mg of rifampicin. Syrup containing 100mg/5ml of rifampicin. Infusion containing 600mg of rifampicin. **Indications:** *Tuberculosis:* in combination with other active anti-tuberculosis drugs; Leprosy (multibacillary and paucibacillary): in combination with at least one other active anti-leprosy drug, to effect conversion to a non-infectious state; *Other infections:* Brucellosis, Legionnaires disease and serious staphylococcal infections, in combination with another appropriate antibiotic. *Prophylaxis of meningococcal meningitis:* for the treatment of asymptomatic carriers of *N.meningitidis* to eliminate meningococci from the nasopharynx; *H.influenzae:* treatment of carriers and chemoprophylaxis of exposed children, 4 years of age or younger. **Dosage & Administration:** ***Oral Administration:*** Tuberculosis: *Adults* 8-12mg/kg o.d.. Usual daily dose for patients 50kg or less: 450mg; for patients 50kg or more: 600mg. *Children* 10-20mg/kg daily (maximum 600mg). Leprosy: 600mg dose once a month or 10mg/kg daily. Usual daily dose for patients 50kg or less: 450mg, for patients 50kg or more: 600mg. Brucellosis, Legionnaires disease or serious staphylococcal infections: *Adults* 600-1200mg daily in 2-4 divided doses. Prophylaxis of meningococcal meningitis: *Adults* 600mg b.d. for 2 days. *Children* (1-12yrs) 10mg/kg b.d. for 2 days. *Children* (3 months-1yrs) 5mg/kg b.d. for 2 days. Prophylaxis of Haemophilus influenzae: *Adults & Children* 20mg/kg o.d. (maximum 600mg) for 4 days. *Neonates (1 month)* 10mg/kg daily for 4 days. A maximum of 8mg/kg o.d. in patients with impaired liver function. Use with caution in elderly patients. ***IV Infusion:*** For acutely ill who are unable to tolerate oral therapy. Tuberculosis: *Adults* 600mg IV infusion o.d. over 2 to 3 hrs. *Children* 20mg/kg o.d. (maximum of 600mg daily); Leprosy, Brucellosis, Legionnaires disease or serious staphylococcal infections: as per oral. **Contra-indications:** Hypersensitivity to rifamycins; presence of jaundice. **Precautions:** Give under the supervision of a respiratory or other suitably qualified physician. If impaired liver function, only give in cases of necessity with dose reduction and careful monitoring of LFT. Rifadin should be withdrawn if clinically significant changes in hepatic function occur. If impaired liver function, elderly, malnourished patients, and possibly children under 2yrs, caution is recommended if isoniazid is used concurrently. All tuberculosis patients should have pre-treatment LFT. In some patients hyperbilirubinemia can occur in the early days of treatment. Possibility of an immunological reaction with intermittent therapy. If serious complications occur, rifamipicin should be stopped and never restarted. **Interactions:** Rifadin has enzyme-inducing properties. Reduced activity of anticoagulants, corticosteroids, cyclosporin, digitalis preparations, oral contraceptives, oral hypoglycaemic agents, dapsone, phenytoin, quinidine, narcotics and analgesics. Diabetes may become difficult to control. **Side effects:** Mild cutaneous reactions and general hypersensitivity reactions involving skin, exfoliative dermatitis, Lyells syndrome, pemphigoid reactions. Anorexia, nausea, vomiting abdominal discomfort, diarrhoea, pseudomembranous colitis, hepatitis. Thrombocytopenia with or without purpura, eosiniphilia, leucopenia, oedema, muscle weakness, myopathy and porphyria exacerbation. Discolouration of urine, sputum and tears. Occasional disturbances of the menstrual cycle. Reactions occurring after intermittent dosage regimens include: 'Flu syndrome'; shortness of breath and wheezing; blood pressure reduction and shock; acute haemolytic anaemia; acute renal failure.
Legal Category: POM
Marketing Authorisation Number: Rifadin Capsules 150mg: PL 4425/5915R; Rifadin Capsules 300mg: PL 4425/5916R; Rifadin Syrup 100mg/5ml: PL 4425/5917R; Rifadin for Infusion 600mg: PL 4425/0051
NHS Price: Rifadin Capsules 150mg x 100 £18.63; Rifadin Capsules 300mg x 100 £37.26; Rifadin Syrup 100mg/5ml x 120ml £3.62; Rifadin for Infusion 600mg (plus 10ml solvent) £7.80
Further information is available from the Marketing Authorisation Holder: Aventis Pharma Ltd, 50 Kings Hill Avenue, Kings Hill, West Malling, Kent, ME19 4AH. **Date of Preparation:** August 2000.

Abbreviated Prescribing Information: Synercid, Powder for Solution for Infusion
Presentation: Vials of powder for solution for infusion containing 150mg quinupristin and 350mg dalfopristin as the mesilate salts. **Indications:** Treatment of nosocomial pneumonia and skin and soft tissue infections (SSTI) caused by susceptible Gram-positive organisms; clinically significant infections caused by vancomycin resistant *E. faecium*; when iv therapy is appropriate and no other agent suitable. Combination therapy recommended for mixed infections with Gram-negative organisms. **Dosage:** Dose 7.5mg/kg. Frequency of dosing 8 hourly. Administer through central venous catheter in 5% glucose over 60 minutes. If necessary initiate with peripheral iv infusion; after infusion flush vein with 5% glucose to minimise irritation. ***Elderly and Obese;*** no dose adjustment: ***Renal and hepatic insufficiency;*** use with caution. ***Paediatrics;*** insufficient data on which to base recommendation. **Contraindications:** Known hypersensitivity to quinupristin, dalfopristin or streptogramins; severe hepatic insufficiency; co-administration with ergot alkaloid derivatives and with drugs metabolised by cytochrome P450 3A4 which prolong QTc interval or with narrow therapeutic window unless close monitoring possible; administration other than by slow infusion. **Warnings and Precautions:** Caution in patients at risk of cardiac arrhythmias, or in mild to moderate hepatic insufficiency; caution when used with drugs metabolised by CYP 3A4 as this may lead to increased plasma levels of these agents; isolated hyperbilirubinaemia may occur; overgrowth and superinfection may occur; use in pregnancy and lactation not recommended; patient should not drive if headache or dizziness occurs. **Adverse Reactions:** Most common – inflammation, pain, oedema, injection/infusion site reaction, thrombophlebitis and haemorrhage with peripheral administration, arthralgia and myalgia (may require dose decrease or discontinuation), nausea, diarrhoea, vomiting, rash, headache, pruritus, asthenia. Less common – oral moniliasis, stomatitis, dyspepsia, constipation, pancreatitis, pseudomembranous colitis, abdominal pain, vaginitis, urinary tract infection, haematuria, sweating, vasodilatation, peripheral oedema, cellulitis, infection, arrhythmia, fever, pneumonia, dyspnoea, pleural effusion, chest pain, back pain, palpitation, paraesthesia, hypertonia, myasthenia, insomnia, anxiety, confusion, dizziness, maculopapular rash, urticaria, potentially severe allergic and anaphylactoid reaction, gout, leg cramps, anorexia, hyponatraemia, hypotension, tachycardia, jaundice, hepatitis, pharyingitis and pruritis. ***Lab changes:*** increases in total and conjugated bilirubin. Also observed changes in eosinophils, blood urea nitrogen, gamma glutamyl transferase, creatine phosphokinase, lactose dehydrogenase, ALT, AST, haemoglobin, haematocrit, potassium, platelets, white blood cells and neutrophils. Thrombocytopenia and pancytopenia have been observed. **Pharmaceutical Precautions:** Store unopened vials at 2–8°C. Vials need reconstitution and dilution before use. Reconstituted vials should be diluted within 30 minutes; diluted solution should be used within 5 hours if stored up to 25° C or 24 hours if stored at 2–8°C; do not freeze. ***Incompatible with saline.***
Legal Category: POM.
Product Licence Number: PL 0012/0328. **Basic NHS Price:** £37.00.
Full Prescribing Information is available on request from the Product Licence holder, Rhône-Poulenc Rorer, 50 Kings Hill Avenue, Kings Hill, West Malling, Kent, ME19 4AH. **Date of Preparation:** January 2000.

Abbreviated Prescribing Information: Targocid
Presentations Vials providing 200mg or 400mg teicoplanin and ampoule of diluent [Water for Injections Ph.Eur.]. **Uses** *Indications:* Treatment of potentially serious Gram-positive infections including patients who cannot be treated with other antibiotics. Therapy of serious staphylococcal infections in patients who cannot receive or have not responded to penicillins or cephalosporins or who have infections with staphylococci resistant to other antibiotics. As antimicrobial prophylaxis in orthopaedic surgery at risk of Gram-positive infection. **Dosage and Administration** *Preparation:* See data sheet. *Administration:* Either i.v. (bolus or 30min infusion) or i.m. *Adults or elderly patients with normal renal function:* Prophylaxis: 400mg intravenously at the induction of anaesthesia. Severe infections: 400mg i.v. every 12 hours for first 3 doses followed by 400mg i.v. or i.m. once daily.Moderate infections: 400mg i.v. or i.m. on day 1 followed by 200mg i.v. or i.m. once daily. *Children:* Can be used from 2 months of age. In severe infections and neutropenic patients, 10mg/kg every 12 hours for first 3 doses followed by 10mg/kg i.v. or i.m. once daily. For moderate infections, 10mg/kg every 12 hours for first 3 doses followed by 6mg/kg i.v. or i.m. once daily. *Neonates:* A loading dose of 16mg/kg on day 1, followed by a maintenance dose of 8mg/kg once daily. These doses should be given as intravenous infusions over 30 minutes. See data sheet for dose in unusual situations, elderly, renally impaired and patients on CAPD. **Contra-indications, Warnings etc.** *Contra-indications:* Hypersensitivity to teicoplanin. *Warnings:* Caution in patients hypersensitive to vancomycin. Red Man Syndrome is not a contra-indication. Thrombocytopenia has been reported with teicoplanin. Perform periodic haematologial studies, liver and renal function tests. Perform serial renal and auditory function tests in prolonged treatment in renal insufficiency or concurrent and sequential use of neurotoxic and/or nephrotoxic drugs. Dosage must be modified in renally-impaired patients - see data sheet. Use may result in overgrowth of non-susceptible organisms, evaluate patient's condition repeatedly, if superinfection occurs during treatment, appropriate measures should be taken. Consider risk-benefit ratio in pregnancy and lactation. *Side-Effects:* Generally mild and transient rarely requiring cessation of therapy. The following have been reported: Erythema, local pain, thrombophlebitis, injection site abscess, rash, pruritus, fever, bronchospasm, anaphylactic reactions, anaphylactic shock, rigors, urticaria, angioedema, exfoliative dermatitis, toxic epidermal necrolysis, erythema multiforme including Stevens-Johnson syndrome and infusion-related events (flushing, erythema), nausea, vomiting, diarrhoea, eosinophilia, leucopenia, thrombocytopenia, thrombocytosis, neutropenia, agranulocytosis (reversible), increases in serum transaminases and/or serum alkaline phosphatase, transient elevations of serum creatinine, renal failure, dizziness and headache, mild hearing loss, tinnitus, vestibular disorder, superinfection. *Overdosage:* Not removed by haemodialysis. Treat symptomatically. **Pharmaceutical Precautions** Store below 25°C. Use immediately after reconstitution. See data sheet for further dilutions.
Legal Category POM. **NHS price and Product Licence Numbers** Targocid 200mg PL 4425/0088 £ 18.90. Targocid 400mg PL 4425/0089 £38.30. Water for Injections PL 4425/0090. .
Further information is available from the Product License holder: Aventis Pharma, West Malling, Kent, ME14 2TI.
Date of last review: May 2000

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This publication, along with the others in the series, is available on the internet at www.evidence-based-medicine.co.uk

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