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Remotely Supporting Antimicrobial Stewardship Programs

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Learning Objectives

• Identify challenges a small rural hospital faces when starting an Antimicrobial Stewardship Program
• Illustrate how an external party can help with implementing an Antimicrobial Stewardship Program
• List current challenges with Antimicrobial Stewardship Program after implementation
Northwest Telepharmacy Solutions

• Remote clinical tele-pharmacist functions
  – 60+ pharmacist staff
• 40 hospital client sites
  – 10 sites in North East LHIN
  – 13 sites with Gold Standard Pharmacy Services
    • 24/7 Pharmacist Medication Order Review
• 3 Family Health Teams
• CCAC Rapid Response Team
  – Home Visits
• British Columbia HealthLinks 811
Accreditation Canada 2013

• New ROP introduced for acute care hospital to have an ASP in place
• NTS had over 30 hospital sites
  – 6 sites had accreditation pending in late 2013 and early 2014
Accreditation Canada 2013

• The program is:
  – inter-disciplinary involving pharmacist, infectious disease physicians, infection control specialists, physicians, microbiology staff, nursing staff, hospital administrators, and information system specialists, as available and appropriate
  – Includes interventions ... that may include audit and feedback, formulary..., education..., guidelines and clinical pathways..., parenteral to oral conversion of antimicrobials
Challenges for Small Hospital

• Limited resources
  – None to 1 on-site pharmacist
  – No ID Physician
  – Everyone is wearing multiple hats
  – Information Systems support

• Limited budget

• Experience or Expertise
  – Lack of guidance

• Microbiology outsourced
Preparing for ASP

• Received funding from 6 hospitals
  – Senior administration support
• Sent 4 pharmacists to ASP conference June 2013
  – Education
  – Networking
  – Brainstorming
• Reviewing the ROP
Preparing for ASP

• Research
  – What have others done?
    • Teaching hospitals
    • Large community hospitals
  – Are there examples of remote ASP?
    • Sonoma Valley Hospital (83-bed rural hospital)
    • Providence St. Mary’s Medical Centre (141-bed community hospital)
    • Southern Brazil community hospital
  – NO REMOTE PHARMACIST ASP MODEL
Implementation for ASP

• Requested for an ASP committee to be formed
  – Remote pharmacist
  – Physician champion
  – Charge RN
  – Pharmacy RN
  – Microbiology manager
  – IS manager
  – Infection control Nurse
  – Director of patient care services
Implementation of ASP

• Terms of reference drafted
• PHO Gap Analysis Completed
  – Excellent tool for self-assessment
    • Helped ASP team realize:
      – What is already in place
      – What still needs to be done

• Developed a plan
Gap Analysis

• Hospital already had:
  – A formulary
    • Restricted antibiotics
    • Process to review
  – ASP Committee formed
  – Clinical pathways in development
  – Pharmacist antibiotic therapy monitoring
    • Renal dosing, Dose optimization and de-escalation but no program

• Hospital didn’t have:
  – IV to PO program
  – Anti- biogram
  – Prospective Audit with intervention and feedback
Plan

- Develop IV to PO program
- Prospective data collection
- Education for physicians and nurses
- Obtain antibiogram
- Focus on Pneumonia and UTIs
<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Start Date (MM/DD/YY)</th>
<th>Stop Date (MM/DD/YY)</th>
<th>Does the Patient Have Any of the Following Devices?</th>
<th>Indication For Use (List all)</th>
<th>Is the Patient Colonized with Resistant Organism</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancomycin 750 mg IV q24h</td>
<td>01-Oct-13</td>
<td>18-Oct-13</td>
<td>No</td>
<td>Septic joint post op rt hip</td>
<td>No</td>
<td>Vanco level ordered for Oct 2 and weekly</td>
</tr>
<tr>
<td>Moxifloxacin 400 mg PO daily</td>
<td>01-Oct-13</td>
<td>11-Oct-13</td>
<td>No</td>
<td>Pneumonia</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>cipro 500 mg po bid</td>
<td>03-Oct-13</td>
<td>08-Oct-13</td>
<td>NO</td>
<td>UTI</td>
<td></td>
<td></td>
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<tr>
<td>Amoxicillin 500 mg PO TID</td>
<td>04-Oct-13</td>
<td>10-Oct-13</td>
<td>No</td>
<td>Pneumonia</td>
<td>No</td>
<td>Blood cultures</td>
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<tr>
<td>Ciprofloxacin 400 mg IV q24h</td>
<td>05-Oct-13</td>
<td>11-Oct-13</td>
<td>Yes, urinary</td>
<td>UTI</td>
<td>No</td>
<td>pt discharged on 11/1/13</td>
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<tr>
<td>Vancomycin 1 g IV q8h</td>
<td>07-Oct-13</td>
<td>09-Oct-13</td>
<td>Yes, urinary</td>
<td>UTI</td>
<td>No</td>
<td>pt discharged on 11/1/13</td>
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<tr>
<td>Pip Tetras 3.375 g IV x 1 dose</td>
<td>07-Oct-13</td>
<td>07-Oct-13</td>
<td>Yes, urinary</td>
<td>UTI</td>
<td>No</td>
<td>pt discharged on 11/1/13</td>
</tr>
<tr>
<td>Cloxacillin 500 mg IV qid</td>
<td>08-Oct-13</td>
<td>18-Oct-13</td>
<td>No</td>
<td>Dermatomyositis autoimmune</td>
<td>No</td>
<td>Originally started Oct 3, 2013 at transfer</td>
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<tr>
<td>Amoxicillin 500 mg PO tid x 7 days</td>
<td>09-Oct-13</td>
<td>18-Oct-13</td>
<td>No</td>
<td>Bladder infection? As per RN, cultures</td>
<td>No</td>
<td>discharged 10/16/13</td>
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</tbody>
</table>
IV to PO Program

- Policy approved by P&T and MAC
- Restricted to:
  - Ciprofloxacin
  - Clindamycin
  - Metronidazole
  - Moxifloxacin
  - Levofloxacin
Antibioticogram for St Francis Memorial Hospital 2011-13

% Susceptible
Number of isolates tested for each organism is indicated in brackets for each year

<table>
<thead>
<tr>
<th>Gram-Negative</th>
<th>Ampicillin</th>
<th>Amox/Clav</th>
<th>Pip/Tazo</th>
<th>Cefazolin</th>
<th>Ceftriaxone</th>
<th>Meropenem</th>
<th>Ciprofloxacin</th>
<th>Septra</th>
<th>Nitrofurantoin</th>
<th>Gentamicin</th>
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<tbody>
<tr>
<td><em>Escherichia coli</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011 (n=181)</td>
<td>66</td>
<td>88</td>
<td>96</td>
<td>90</td>
<td>97</td>
<td>100</td>
<td>85</td>
<td>79</td>
<td>97</td>
<td>96</td>
</tr>
<tr>
<td>2012 (n=155)</td>
<td>70</td>
<td>94</td>
<td>98</td>
<td>85*</td>
<td>97</td>
<td>100</td>
<td>89</td>
<td>85</td>
<td>97</td>
<td>94</td>
</tr>
<tr>
<td>2013 (n=171)</td>
<td>62</td>
<td>84</td>
<td>95</td>
<td>71</td>
<td>97</td>
<td>100</td>
<td>91</td>
<td>90</td>
<td>99</td>
<td>94</td>
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<tr>
<td><em>Klebsiella pneumoniae</em></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2011 (n=22)</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>95</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>81</td>
<td>36</td>
<td>100</td>
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<td>2012 (n=21)</td>
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<td>95</td>
<td>91*</td>
<td>95</td>
<td>100</td>
<td>100</td>
<td>95</td>
<td>47</td>
<td>100</td>
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<tr>
<td>2013 (n=22)</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>91</td>
<td>95</td>
<td>100</td>
<td>90</td>
<td>100</td>
<td>50</td>
<td>100</td>
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<tr>
<td><em>Proteus mirabilis</em></td>
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<td>2011-12 (n=23)</td>
<td>91</td>
<td>96</td>
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<td>91*</td>
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<td>100</td>
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<td>96</td>
<td>96</td>
<td>96</td>
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<tr>
<td>2013 (n=10)</td>
<td>93</td>
<td>93</td>
<td>100</td>
<td>44</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>87</td>
<td>93</td>
<td>100</td>
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</tbody>
</table>

*Breakpoint reduced in 2012

<table>
<thead>
<tr>
<th>Enterobacter spp</th>
<th>Pip/Tazo</th>
<th>Ceftazidime</th>
<th>Meropenem</th>
<th>Ciprofloxacin</th>
<th>Tobramycin</th>
<th>Gentamicin</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12 (n=24)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td>100</td>
<td>96</td>
<td>96</td>
<td>33</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pseudomonas aeruginosa</th>
<th>Pip/Tazo</th>
<th>Ceftazidime</th>
<th>Meropenem</th>
<th>Ciprofloxacin</th>
<th>Tobramycin</th>
<th>Gentamicin</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12 (n=13)</td>
<td>100</td>
<td>92</td>
<td>88</td>
<td>88</td>
<td>77</td>
<td></td>
</tr>
<tr>
<td>2013 (n=6)</td>
<td>88</td>
<td>89</td>
<td>100</td>
<td>88</td>
<td>88</td>
<td>77</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gram-Positive</th>
<th>Cefoxacin</th>
<th>Cefazolin</th>
<th>Erythromycin</th>
<th>Clindamycin</th>
<th>Tetracycline</th>
<th>Septra</th>
<th>Vancomycin</th>
</tr>
</thead>
</table>
Current Challenges

- Continuing education of staff
- Resources – no ID specialist
- Manual data collection
- Documentation
- Prospective audit and feedback
- Data analysis
  - Reporting of Metrics
    - DDD vs DOT vs LOT
    - CDI monthly versus quarterly
ASP Data Collection Result

![Graph showing DOT per 1000 patient days and Monthly Cost of ABx over the months of September to March.](image-url)
ASP Data Collection Results

**Pneumonia**

- DOT per 1000 patient day

- Chart showing the number of pneumonia cases from September to March.
ASP Data Collection Results

C. Diff Rate per 1000 pt days

Graph showing C. Diff Rate from January to March with peaks in April, May, October, November, January, and February.
ASP Data Collection Results

- Rate of hospital acquired cases of MRSA bacteremia
- Rate of hospital acquired cases of VRE bacteremia

Graph showing data collection results from January to March.