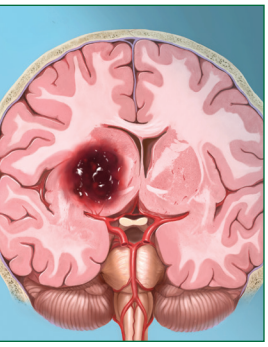

Bundled Care Interventions for the Management of **Intracerebral Hemorrhage:** A Review

Samantha Rodriguez, PharmD, BCCCP
Brian Gilbert, PharmD, MBA, BCCCP
Kathryn Qualls, PharmD, BCPS, BCCCP
Morgan Cooper, MSN, AGACNP-BC, FNP-BC
Christian Deyoung, MBA
Towne Walston, MD

BACKGROUND Spontaneous intracerebral hemorrhage affects approximately 80 000 people in the United States annually and is associated with significant risk of disability and mortality. As with many acute conditions, protocolized care has been shown to benefit patients with intracerebral hemorrhage. The 2024 American Heart Association/American Stroke Association guidance document for intracerebral hemorrhage management recommends bundled care interventions, including timely blood pressure control, anticoagulation reversal, and surgical intervention to improve outcomes.

OBJECTIVE To assess the rationale for and literature pertaining to the recommended bundled care interventions for intracerebral hemorrhage management and offer practical guidance for nurses to optimize patient care.

METHODS The recommendations in the 2024 American Heart Association/American Stroke Association guidance document for intracerebral hemorrhage management were reviewed, the literature supporting bundled care interventions was assessed, and a narrative review of this information was generated.

RESULTS Protocolized care has shown benefit for many devastating conditions, including acute ischemic stroke. Recent guidelines and evidence suggest that this kind of intervention may also improve outcomes for intracerebral hemorrhage patients. The critical care nurse has a significant role to play in facilitating timely interventions for intracerebral hemorrhage patients, particularly regarding neurologic status changes and blood pressure control. Further study is needed to determine the most appropriate timing and targets for the best outcomes.

CONCLUSION Recent evidence and guidance documents support the use of bundled care protocols to improve outcomes for individuals experiencing intracerebral hemorrhage. Early recognition of intracerebral hemorrhage and knowledge of bundled care interventions may benefit these patients and improve outcomes. (*Critical Care Nurse*. 2026;46[2]:9-17)

CE 1.0 hour, CERP A

This article has been designated for CE contact hour(s). The evaluation tests your knowledge of the following objectives:
1. Identify potential bundled-care interventions for patients experiencing intracerebral hemorrhage (ICH).
2. Describe appropriate interventions for the management of hypertension in patients with ICH.
3. Recognize appropriate interventions for anticoagulation reversal in patients experiencing ICH.

When completing this activity, you will need to identify 3 concepts you have learned by reading this article.

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 doi:https://doi.org/10.4037/ccn2026556

Spontaneous intracerebral hemorrhage affects approximately 80 000 people in the United States annually.[1,2] It is the second most common type of stroke following acute ischemic stroke (AIS).[1,2] Intracerebral hemorrhage is associated with prolonged recovery time, risk of disability, and a nearly 40% in-hospital mortality rate.[3] Causes of intracerebral hemorrhage include chronic hypertension, cerebral amyloid angiopathy, coagulopathy, platelet dysfunction, vasculopathy, and hemorrhagic conversion.[3]

Intracerebral hemorrhage pathophysiology is multifaceted. Initial neuronal tissue injury is caused by a sudden increase of blood within parenchymal tissue, resulting in compression, with larger volumes associated with increased morbidity and mortality.[3,4] Following the initial bleed, hematoma expansion occurs in more than 70% of cases within the first 24 hours.[4] Hematoma expansion is typically due to continued or repeated bleeding and is often delayed in patients taking antithrombotic agents.[3,4] In the 24 to 72 hours following initial hemorrhage, vasogenic edema occurs around the hemorrhage, leading to worsening compression effects and neurologic deterioration.[3]

During the "golden hour" of stroke care, every minute counts toward reducing brain damage and improving patient outcomes.

Improvements in prompt recognition and treatment of AIS have resulted in reduced mortality.[5] However, there has been minimal improvement in mortality for patients with intracerebral hemorrhage.[5] Guidelines for ischemic stroke treatment have focused on time-based, bundled interventions to improve outcomes, but until recently there were few recommendations regarding prompt treatment for intracerebral hemorrhage.[6] This article addresses recent guidelines and literature suggesting that bundled measures may also improve outcomes for intracerebral hemorrhage patients.

Performance and Quality Measures for Spontaneous Intracerebral Hemorrhage

A 2024 guidance document for intracerebral hemorrhage management issued by the American Heart Association (AHA)/American Stroke Association (ASA) recommended bundled care interventions including timely blood pressure control, anticoagulation reversal, and surgical intervention. The specific recommendations are described below.

Prehospital Care

Prehospital care is critical to improving time-sensitive outcomes for individuals experiencing strokes. Stroke management begins before the patient reaches the hospital, with emergency medical services (EMS) personnel. The ability of EMS personnel to rapidly identify stroke symptoms and initiate early notification to receiving hospitals is vital in reducing the time to treatment and crucial for minimizing brain damage and improving chances of survival.[7]

Once a stroke is suspected, EMS prehospital notification to the receiving hospital allows for activation of stroke protocols. This process includes mobilizing stroke teams and preparing imaging equipment, which is essential for distinguishing between ischemic and hemorrhagic strokes. This prehospital process is critical in the "golden hour" of stroke care, in which every minute counts toward reducing brain damage and improving patient outcomes.

Initial Evaluation

As the patient reaches the emergency department, the ability to identify and accurately diagnose an intracerebral

Authors

Samantha Rodriguez is a critical care clinical pharmacy specialist, Wesley Medical Center, Wichita, Kansas.

Brian Gilbert is an emergency medicine clinical pharmacy specialist, Wesley Medical Center.

Kathryn Qualls is a neurocritical care clinical pharmacy specialist, Wesley Medical Center.

Morgan Cooper is a critical care nurse practitioner, Wesley Medical Center.

Christian Deyoung is a doctor of pharmacy candidate, University of Kansas School of Pharmacy, Lawrence, Kansas.

Towne Walston is an emergency medicine fellow, Wesley Medical Center.

Corresponding author: Samantha Rodriguez, PharmD, BCCCP, Wesley Medical Center, 550 N Hillside St, Wichita, KS (email: samantha.rodriguez720@gmail.com).

hemorrhage upon initial evaluation is imperative. After arrival, if prehospital notification was completed, next steps include simultaneously taking a rapid history, performing a physical examination, and completing laboratory assessments.[8] The rapid history should include symptom onset, vascular risk factors, medications (in particular, any antithrombotic therapies), presence of cognitive impairment, substance use, and medical history related to liver disease, uremia, malignancy, or hematologic disorders. A thorough physical examination includes vital signs as well as general and focused neurologic examinations. Laboratory tests to order include complete blood count, basic metabolic panel, prothrombin time/international normalized ratio, and urine drug screen. Depending on local oral anticoagulation prescribing habits, factor-Xa activity or dilute thrombin time may be added to help assess use of direct oral anticoagulants (DOACs). After taking a history, performing a physical examination, and obtaining blood for laboratory monitoring, it is important to obtain rapid computed tomographic or magnetic resonance neuroimaging within 25 minutes of arrival per guideline recommendations.[8]

If a patient is diagnosed with a spontaneous intracerebral hemorrhage, a grading scale called the ICH Score can be used for risk stratification (Table 1).[9] It should be calculated within 6 hours from the time of arrival to the hospital and documented in the medical record.[10] It may be calculated by a physician, an advanced practice professional, or a registered nurse.[10] Scores range from 0 to 6, with higher scores associated with increased morbidity and mortality.[9]

The initial evaluation period for these patients after arriving to the hospital is a critical time. Systems must be in place to complete the above-mentioned tasks efficiently and accurately to ensure that adequate interventions are identified and provided.

Blood Pressure Control

The ideal systolic blood pressure (SBP) target, treatment timing, and choice of antihypertensive agents remain the subject of ongoing debate. The current AHA guidelines, informed by key studies such as INTERACT2 (Intensive Blood Pressure Reduction in Acute Cerebral Hemorrhage Trial 2) and ATACH-2 (Antihypertensive Treatment of Acute Cerebral Hemorrhage II), recommend targeting an SBP of less than 140 mm Hg within the first hour of treatment.[8] INTERACT2 showed a modest benefit in improving outcomes when blood pressure was lowered to 140 mm Hg.[11] However, ATACH-2, which explored a more aggressive SBP target (110-139 mm Hg), did not show a significant benefit and raised concerns about adverse renal outcomes when blood pressure was lowered too aggressively.[12] This controversy is further compounded by concerns that excessive blood pressure reduction could compromise cerebral perfusion, particularly in patients with chronic hypertension, who may rely on higher pressures for adequate perfusion. Furthermore, INTERACT3 (Intensive Care Bundle With Blood Pressure Reduction in Acute Cerebral Hemorrhage Trial 3), a randomized controlled trial, demonstrated that early, goal-directed blood pressure management to lower SBP below 140 mm Hg within 6 hours of symptom onset improved functional outcomes compared with usual care and reduced the incidence of serious adverse events.[13]

The speed of achieving blood pressure reduction is crucial, as early intervention is associated with reduction in hematoma expansion and better outcomes.

A common initial strategy in acute management of elevated blood pressure in intracerebral hemorrhage involves administering a bolus of labetalol.[6,11] Labetalol, a combined α- and β-blocker, has a rapid onset of action, making it ideal for immediate blood pressure reduction

Table 1 ICH Score calculation[9]

Component	ICH Score points
Initial GCS score	
3-4	2
5-12	1
13-15	0
ICH volume on initial CT, cm^3	
≥30	1
<30	0
IVH present on initial CT	
Yes	1
No	0
Infratentorial origin of ICH	
Yes	1
No	0
Age, y	
≥80	1
<80	0
Total ICH Score	**0-6**

Abbreviations: CT, computed tomography; GCS, Glasgow Coma Scale; ICH, intracerebral hemorrhage; IVH, intraventricular hemorrhage.

Table 2 Anticoagulation reversal agents[1,26-28]

Anticoagulation agent	Reversal/hemostatic agent	Side effects	Onset
Unfractionated heparin Low-molecular-weight heparin	Protamine sulfate	Hypotension Hypersensitivity reactions	5 Minutes
Warfarin	Vitamin K, 4F-PCC (Kcentra)	Vitamin K, anaphylaxis 4F-PCC, clotting Hypersensitivity reactions	4F-PCC, 15 minutes
Dabigatran	Idarucizumab (Praxbind)	Hypersensitivity reaction Thromboembolic risk	Within minutes
Argatroban, bilvarudin	4F-PCC (Kcentra)	Clotting, hypersensitivity reactions	15 Minutes
Rivaroxaban, apixaban	4F-PCC (Kcentra)	Clotting, hypersensivity reaction	15 Minutes
Edoxaban	4F-PCC (Kcentra)	Clotting, hypersensitivity reaction	15 Minutes

in emergency settings, consistent with recommendations for other stroke cohorts.[14,15] A typical bolus dose is 10 to 20 mg intravenously, which can be repeated every 10 minutes as needed. As labetalol is a β-blocker, there is a risk of bradycardia, so telemetry monitoring is necessary.[15] While labetalol is taking effect, preparations should be made for a continuous infusion of a titratable medication such as clevidipine or nicardipine, both dihydropyridine calcium channel blockers with vasodilatory effects and quick onsets of action.[16-18] This approach allows for rapid control of blood pressure while transitioning to a more stable, long-term management plan.[19] Although clevidipine has a much more rapid onset of action than nicardipine, the lack of long-term benefit and overall cost may prohibit its use.[17,18,20] Other agents, such as hydralazine (a vasodilator with a longer and less predictable response), esmolol (a β_1-selective β-blocker), and diltiazem (a non-dihydropyridine calcium channel blocker), are used less frequently because of their specific side effect profiles and drug-drug interactions.[21-23]

The critical care nurse is crucial in ensuring that elevated blood pressure is identified quickly and treated as well as maintaining goal blood pressure.

The speed of achieving blood pressure reduction is crucial, as early intervention is associated with reduction in hematoma expansion and better outcomes. Delayed blood pressure management, even by a few hours, significantly diminishes the benefits. Additionally, maintaining stable blood pressure control is essential, as fluctuations in blood pressure are linked to worse outcomes in patients with intracerebral hemorrhage.[24] The critical care nurse is crucial in ensuring that elevated blood pressure is identified quickly and treated as well as maintaining goal blood pressures. Despite the controversies, achieving and maintaining an SBP of 130 to 140 mm Hg remain a widely accepted goal in intracerebral hemorrhage management, balancing the risks of hematoma expansion with those of cerebral hypoperfusion.[24]

Anticoagulation Reversal

In patients with anticoagulation-associated intracerebral hemorrhage, reversal should occur promptly. Guidelines recommend reversal administration less than 90 minutes after intracerebral hemorrhage is confirmed by radiology.[1,8] This recommendation is consistent with previous guidelines for intracerebral hemorrhage management, but some have urged reducing this window to 60 minutes to match door-to-needle time with the AIS cohort.[1]

Patients with warfarin-associated intracerebral hemorrhage should receive coadministration of 4-factor prothrombin complex concentrate (4F-PCC) and intravenous phytonadione (Table 2).[25] Four-factor prothrombin complex concentrate has proved superior to fresh frozen plasma because of its higher amounts of purified coagulation factors, faster onset, and lower risk of volume overload.[25] Phytonadione has a longer onset of action and should be coadministered with 4F-PCC to prevent rebleeding.[6,25]

In patients with intracerebral hemorrhage secondary to heparinoids, protamine sulfate is the recommended reversal agent.[1] Protamine sulfate reverses both unfractionated heparin and low-molecular-weight heparin. However, it does not completely reverse anti-Xa activity

for low-molecular-weight heparin, and additional hemostatic agents may be necessary. Protamine neutralizes anticoagulation by binding to heparin and forming a salt that is eliminated hepatically.[1] Slow infusion rates are important for protamine administration because of potential hypotension and hypersensitivity reactions.[28]

Dabigatran-associated intracerebral hemorrhage should be reversed with idarucizumab, a monoclonal antibody that binds dabigatran and its metabolites and neutralizes their activity.[1,26] Idarucizumab works within minutes and restores hemostasis in approximately 12 hours. If idarucizumab is not available, 4F-PCC and renal replacement therapy can be used to promote thrombin generation and hemostasis.[1] For parenteral direct thrombin inhibitors such as argatroban and bivalirudin, there is not a specific reversal antidote, and management typically consists of prompt cessation of the medication.[29,30]

Furthermore, DOACs such as apixaban and rivaroxaban can lead to factor Xa inhibitor–associated intracerebral hemorrhage.[1] Their anticoagulant effect can be altered by administering andexanet alfa or 4F-PCC.[1,26] Andexanet alfa is a reversal treatment approved by the US Food and Drug Administration that works by binding and sequestering factor Xa inhibitors,[31] whereas 4F-PCC is an off-label reversal therapy that replaces coagulation factors and promotes thrombin generation.[1] According to the 2024 AHA/ASA guidelines for the management of spontaneous intracerebral hemorrhage, it is recommended to administer andexanet alfa or, if that is unavailable, 4F-PCC or activated PCC.[1] However, this recommendation was made before the recently reported ANNEXA-I (Andexanet Alfa, a Novel Antidote to the Anticoagulation Effects of FXA [Factor Xa] Inhibitors) trial, which compared usual care (the majority of participants received 4F-PCC) with andexanet alfa.[31] Patients who received andexanet alfa had a higher incidence of achieving hemostasis but also substantial risk of arterial thrombotic complications such as stroke and myocardial infarction.[31] Based on these results, the US Food and Drug Administration considers the risks of using andexanet alfa to outweigh the benefits, and the drug's manufacturer voluntarily removed the product from the US market as of December 22, 2025.[32] As such, factor Xa inhibitor-associated intracerebral hemorrhage should be treated with 4F-PCC or activated PCC.

Dysphagia Screening

Dysphagia screening is a crucial component of intracerebral hemorrhage bundled care, as it targets early identification of swallowing difficulties and mitigates associated risks, including increased mortality and posthospital aspiration pneumonia.[1] Guidelines emphasize that all patients with intracerebral hemorrhage should undergo a dysphagia screening protocol before oral intake of fluids, nutrition, or medications.[1] The guidelines stress the importance of a formal protocol approved by the treating institution, and ideally individualized to each patient. Although various screening methods are documented in the literature, there is no consensus on a single method, allowing institutions to choose the protocol that best fits their resources and patient population.[1]

Venous Thromboembolism Prophylaxis

After intracerebral hemorrhage, about 7% of patients develop thromboembolic complications, with a potentially higher risk in those who have received reversal agents or prothrombotic agents such as PCC.[27] Because of this risk, decisions about using mechanical or chemical venous thromboembolism (VTE) prophylaxis should be considered. The CLOTS3 (Clots in Legs Or sTockings after Stroke) trial evaluated the benefit of intermittent pneumatic compression devices versus nothing; use of these devices resulted in an absolute risk reduction of 3.6% in this cohort.[33] The Neurocritical Care Society's VTE prophylaxis guidelines discuss initiating chemical VTE prophylaxis within 48 hours in the presence of stable hematoma and no ongoing coagulopathy—albeit with a weak recommendation.[34] The 2024 intracerebral hemorrhage guidelines outline the metric for initiating VTE prophylaxis with pneumatic compression devices within 24 hours of intracerebral hemorrhage diagnosis.[1] The cost associated with this recommendation should be considered minimal compared with the direct and indirect costs of an in-hospital VTE.

All patients with intracerebral hemorrhage should undergo a dysphagia screening protocol before oral intake of fluids, nutrition, or medications.

Neurosurgical Intervention

Neurosurgery and minimally invasive evacuation (MIE) are pivotal components in the management of

Table 3 Glascow Coma Scale score calculation[36]

Response	Score
Eye opening	
Spontaneously	4
To speech	3
To pain	2
No response	1
Best verbal response	
Oriented to time, place, and person	5
Confused	4
Inappropriate words	3
Incomprehensible sounds	2
No response	1
Best motor response	
Obeys commands	6
Moves to localized pain	5
Flexion withdrawal from pain	4
Abnormal flexion	3
Abnormal extension	2
No response	1
Total score	3-15

Best practices
- Check for any factors that may affect your assessment.
- Observe for spontaneous behaviors in the 3 components.
- Use verbal and/or physical stimuli if no spontaneous behavior occurs.
- Score based on response

Table 4 Bundle care component goals[13]

Component	Within 1 hour of treatment
Systolic blood pressure	<140 mm Hg Stop treatment if SBP <130 mm Hg
Blood glucose	History of diabetes: 7.8-10 mmol/L No diabetes: 6.1-7.8 mmol/L
Pyrexia	<37.5 °C
Anticoagulation reversal (warfarin)	INR <1.5 Use FFP or PCC

Abbreviations: FFP, fresh frozen plasma; INR, international normalized ratio; PCC, prothrombin complex concentrate; SBP, systolic blood pressure.

intracerebral hemorrhage, particularly in cases in which the hemorrhage's size, location, or associated neurologic impact is catastrophic. These procedures are designed to alleviate the deleterious effects of hematomas by reducing intracranial pressure, minimizing mass effect on brain structures, and potentially improving neurologic and functional outcomes.[1]

The primary benefit of MIE and neurosurgery is the reduction of hematoma volume, which results in decreased intracranial pressure. Elevated intracranial pressure is a significant contributor to secondary brain injury in intracerebral hemorrhage patients, as it can lead to cerebral edema, herniation, and further ischemic damage to brain tissues. There is also evidence that early intervention may improve functional outcomes, particularly in patients who are experiencing rapid neurologic decline due to hematoma expansion.[1,5,35] Although the optimal time for surgery or evacuation remains unknown, earlier evacuation appears to be more beneficial than delayed procedures.[1,5,35] The rationale behind this timing is to prevent further deterioration and mitigate the risk of secondary injury, which can be exacerbated by prolonged elevated intracranial pressure and ongoing mass effect.

These benefits must be weighed against the potential risks and harms associated with the procedures. Surgical complications including infection, bleeding, and damage to surrounding brain tissue, as well as the risk of rebleeding after the procedure, are significant considerations.[8] The size and location of the hematoma may make conservative management a more appropriate option for some patients.[1]

Postprocedure monitoring is essential to ensure optimal outcomes and the detection of any complications that may arise following MIE or neurosurgery. Continuous intracranial pressure monitoring is critical in patients with hydrocephalus for detecting any elevation that might indicate rebleeding or worsening cerebral edema, which contribute to increased mortality.[1,8] Regular neurologic assessments, including evaluations using the Glasgow Coma Scale score (Table 3) and monitoring pupil size and reaction, are necessary to identify early signs of deterioration. Follow-up imaging with computed tomography or magnetic resonance imaging is often required to assess the success of the evacuation and identify any residual hematoma or new bleeding.[37] Infection prevention is also a key consideration, given the risk of postoperative infections, particularly in patients who have undergone craniotomy or other invasive procedures.[38]

The INTERACT3 Trial

Benefits of goal-directed bundled care were evaluated in the INTERACT3 trial.[13] It specifically evaluated the impact of early intensive management of blood pressure, blood glucose, pyrexia, and warfarin-associated coagulopathy (Table 4).

The INTERACT3 trial included patients aged 18 years or older who presented within 6 hours of intracerebral hemorrhage symptom onset and excluded intracerebral

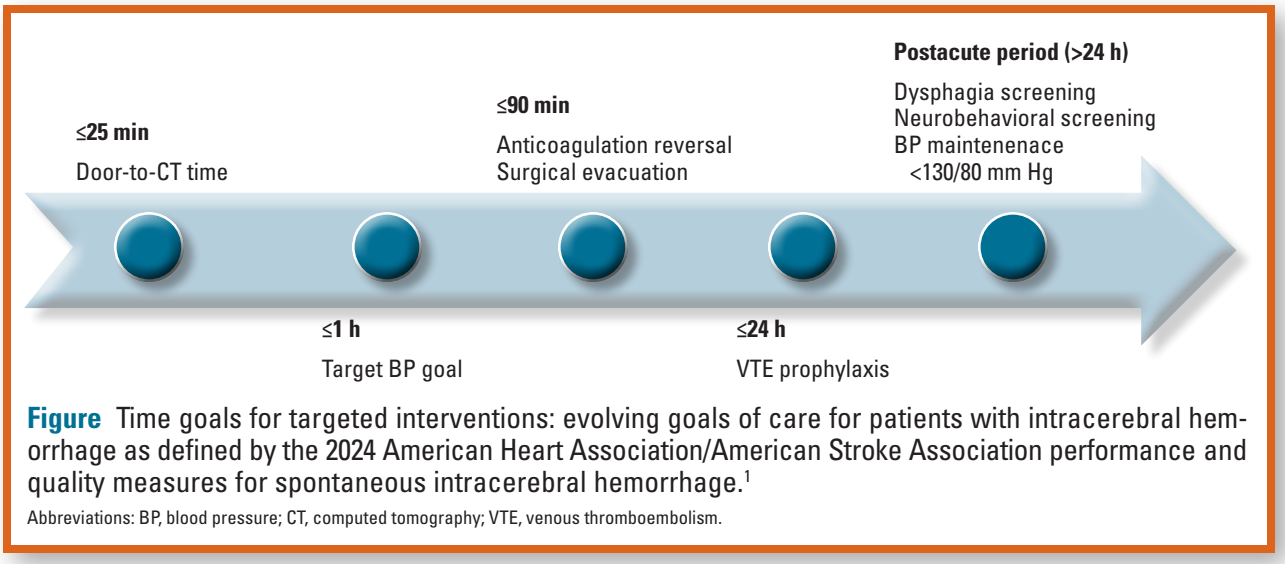

Figure Time goals for targeted interventions: evolving goals of care for patients with intracerebral hemorrhage as defined by the 2024 American Heart Association/American Stroke Association performance and quality measures for spontaneous intracerebral hemorrhage.[1]

Abbreviations: BP, blood pressure; CT, computed tomography; VTE, venous thromboembolism.

hemorrhage due to structural abnormality or reperfusion therapy.[13] A total of 121 sites were included, primarily in low- or middle-income countries that had no or inconsistent protocols for intracerebral hemorrhage treatment.[13]

The primary outcome was functional recovery at 6 months, measured via the modified Rankin scale.[13] Time to goal blood pressure from initiation of treatment was the only significantly different measure noted between groups, with the care bundle group achieving SBP less than 140 mm Hg at a median of 2.3 hours and the usual care group at 4 hours.[13] Other targets were similar between groups, although this finding may be due to fewer patients requiring interventions for hyperglycemia, pyrexia, and anticoagulation reversal. Patients in the care bundle group did have a lower likelihood of poor functional outcomes (odds ratio, 0.86; 95% CI, 0.76-0.97; $P = .02$) and fewer serious adverse events compared with usual care (16.0% vs 20.1%, $P = .01$).[13] These benefits were consistent across sensitivity analyses (odds ratio, 0.84; 95% CI, 0.73-0.97; $P = .02$).[13]

Overall, INTERACT3 suggests that adherence to a care protocol with an emphasis on rapid blood pressure control may result in improved outcomes for patients with intracerebral hemorrhage.[13] The only study component that was achieved more quickly in the care bundle group was blood pressure control, so it is unclear whether other components had a significant effect on outcomes.[1] For anticoagulant reversal, this trial included only patients on warfarin, which limits its applicability to the growing number of patients receiving DOACs.[1,5] As this study was conducted in hospitals with little to no protocolized intervention for intracerebral hemorrhage treatment, its results along with evidence of the benefit of protocolized care in other devastating conditions support bundled care for patients with intracerebral hemorrhage. However, further evidence is needed to evaluate the non–blood pressure-focused components of this care bundle.

Bundled Care

Updates on management of intracerebral hemorrhage emphasize the importance of timely bundled care and specific treatment strategies to improve outcomes. Bundled care collates multiple evidence-based interventions, such as blood pressure control, anticoagulation reversal, and surgical evacuation, to improve mortality and neurologic function in this cohort. Li et al[5] discussed the critical need to implement a standardized protocol for the management of intracerebral hemorrhage, emphasizing timely evidence-based interventions. Targeted interventions and prospective time goals can be found in the Figure.

Patients in the care bundle group did have a lower likelihood of poor functional outcomes and fewer serious adverse events compared with usual care.

Blood pressure management is a crucial component of intracerebral hemorrhage bundled care. Elevated blood pressure is common in the acute phase and is linked with hematoma expansion and poor outcomes.[3] Trials like INTERACT2 and ATACH-2 highlighted the potential benefits of intervention within the first 2 to 3 hours of

onset.[11,12] Despite mixed results, these trials did demonstrate that early and aggressive blood pressure control can reduce the risk of hematoma expansion.

Anticoagulation reversal is critical for intracerebral hemorrhage patients because agents such as warfarin or DOACs increase coagulopathy and hematoma expansion risk.[5] Rapid reversal reduces the risk of continued bleeding and hematoma expansion, but it remains controversial whether it improves mortality and functional outcomes in intracerebral hemorrhage patients.[5]

Surgical interventions, particularly MIE, show promise in managing intracerebral hemorrhage.[5] Appropriate timing of these interventions and the best surgical approach remain controversial. However, evidence seems to suggest that earlier evacuation is associated with improved mortality and improved functional outcomes. Postoperative monitoring of intracranial pressure and neurologic assessments are crucial to detect any complications from the procedure.[5]

Bundled care ensures adherence to best practices, improves outcomes, and promotes timely interventions. Evidence in intracerebral hemorrhage shows that care bundles reduce mortality, enhance monitoring and planning, and support holistic, effective management.[5]

Discussion

Protocolized or bundled care has been beneficial for many devastating conditions, including AIS. The objective of this article was to review recent evidence and guidelines suggesting that this kind of intervention may also improve outcomes for intracerebral hemorrhage patients.

The primary interventions that have shown improvement in mortality and long-term disability risk are rapid blood pressure control, anticoagulation reversal, and timely surgical intervention. The critical care nurse has an important role to play in identifying acute changes in neurologic status and ensuring blood pressure control for these patients. Familiarity with screening tools, common therapeutic interventions, and potential treatment agents will allow nurses to advocate for timely care for their patients.

Further study is needed to determine whether additional targets may have a significant impact on outcomes. INTERACT3 evaluated other hemodynamic factors such as pyrexia and hyperglycemia but did not show a significant difference for them.[13] This finding may be due to few patients needing such interventions in this study.

The most appropriate timing of these interventions also requires further study. The "golden hour" of stroke care is a tenet of AIS treatment that may also be applied to intracerebral hemorrhage treatment. "Time is brain" refers to the fact that ischemia, whether from AIS or hemorrhage, results in progressive neuronal tissue damage. Thus, rapid evaluation and treatment of intracerebral hemorrhage is imperative for good patient outcomes, but specific time frame recommendations require further evaluation.

Conclusion

Intracerebral hemorrhage is a potentially devastating condition that can result in death or lifelong disability. As such, it is important that health care providers focus on improvements in care that will reduce these long-term sequelae. Recent evidence and guidelines support the use of bundled care protocols to improve outcomes for these patients. Early recognition of intracerebral hemorrhage and knowledge of bundled care interventions that may benefit these patients constitute an important first step toward improving outcomes. CCN

Financial Disclosures
None reported.

See also

To learn more about caring for patients with stroke, read "Use of Rapid Response Teams to Expedite Imaging and Treatment for Inpatients With Acute Stroke" by Siaron et al in *AACN Advanced Critical Care,* 2025;36(4):317-324. https://doi.org/10.4037/aacnacc2025924. Available at **www.aacnacconline.org**.

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